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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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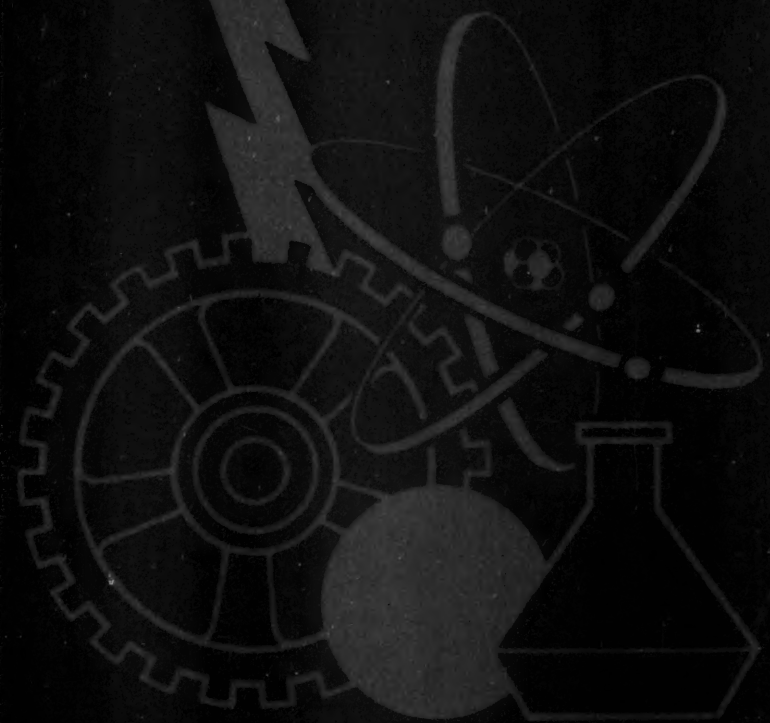

U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

December 26, 1978 Volume 977 Number 4

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Title 37—Patents, Trademarks, and Copyrights

CHAPTER I—PATENT AND TRADEMARK OFFICE, DEPARTMENT OF COMMERCE

PART 4—FORMS FOR TRADEMARK CASES

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Final rule.

SUMMARY: The Patent and Trademark Office adopts revisions to the suggested forms for use in trademark cases. These revisions are intended to improve suggested forms which had been found to be confusing or susceptible to misinterpretation and provide a new suggested form to eliminate the need for the user to combine two forms.

DATES: Effective date: January 1, 1979.

FOR FURTHER INFORMATION CONTACT:

Miss Katharine I. Hancock by telephone at (703) 557-5380, or by mail marked to her attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: In the FEDERAL REGISTER of May 3, 1977 (42 FR 22378) there was published a Patent and Trademark Office proposal to revise certain existing forms and provide one new form for trademark cases. Comments were received from six persons. Two persons suggested that the the word "swears," proposed at the beginning of verifications and affidavits, was not appropriate and that language relating to oath should be confined to the jurat. This suggestion has been adopted. It was suggested by two persons that double signatures be eliminated from the forms for opposition and petition to cancel, and this suggestion has been adopted. Also, after further consideration with the object of eliminating confusion, inconsistency and error from the forms, some additional changes to forms set out in the proposal, and to forms 4.7, 4.9, 4.11 and 4.23 which were not included in the proposal, are being adopted.

Changes which have not been published for comment do not represent any change in practice but are editorial in nature and do not impose a burden on anyone; further opportunity for comment is therefore deemed not necessary.

The ways in which the changes being adopted vary from the published proposal are summarized as follows:

The words "hereby swears" proposed at the beginning of verifications and affidavits are replaced by the word "states." This change appears in forms 4.1, 4.5, 4.6, 4.13, 4.14, 4.15, 4.16, 4.16 (Combined 8 & 15), 4.17 and 4.18.

In forms 4.1, 4.1a 4.7, 4.8, 4.9 and 4.10, where goods or services are set forth, the terms "(Common, usual or ordinary name of (goods or services))" and "(Insert illustrative examples of the goods or services)" are deleted and the term "the following (goods or services):" is inserted instead, although the format of form 4.8 makes it necessary to use the variation "Name the goods or services."

In forms 4.1 and 4.1a, the term "trade style" is deleted and "business trade name" put in its place in identifying an individual applicant in order to conform more closely to the language of the statute. The wording "including street, city and State" is deleted from the address lines. The same changes have been made, where appropriate, in forms 4.17 and 4.18.

In form 4.1a, last clause, the word "herein" is deleted as unclear; the word "further" and the last occurrence of the word "that" are deleted as unnecessary.

In form 4.5, "firm" is changed to "partnership" as a more definite term for the entity for which the form is designed; "member of firm" is changed to "partner;" and the wording "including street, city and State" in the address, as well as the wording and space for domicile, are deleted.

In form 4.6, the proposed change of the word "affidavit" to "application" in the verification is not adopted; instead, the word "affidavit" is changed to "instrument" because the paper being executed contains both an application and an affidavit (verification) and the term "instrument" will encompass both. The wording "including street, city and State" in the address is deleted.

In forms 4.8 and 4.10, footnote (5) is replaced by new footnote (16) in order to clarify instructions for setting forth the manner of use of the mark; as a result, present footnote numbers (16), (17) and (18) in companion forms 4.9 and 4.11 are changed to numbers (17), (18) and (19), respectively.

In form 4.8, last sentence, the words "declaration from form" are inserted before "4.1a" in order to make it clear that form 4.1a is a declaration form.

In form 4.9, in the heading, the words "(If known)" under Class No. are replaced by "(A, for Goods; B, for Services)" in view of the fact that those are the only classes for certification marks. The term "(or form 4.7)" is placed after "footnote (5)" to accommodate either goods or services. For the sake of clarity, footnote (17) which explains certification has been reworded slightly.

In form 4.10 the phrase "Use form 4.1" is changed to "Use body of form 4.1, 4.7 or 4.8" in order to be more clear and to accomodate services and collective mark situations; under "Notes," reference is made to form 4.8 in addition to form 4.1 for the same reason.

In form 4.13, the statement in the verification "that the applicant for renewal owns the above identified registration" is deleted as it constitutes repetition.

In forms 4.13 and 4.16, where goods are listed, the words "or services" and "or 'all the services' " are added, where appropriate, to accommodate services as well as goods.

In forms 4.13, 4.14, 4.15 and 4.16 (Combined 8 & 15), in the Note relating to designation of a domestic representative, for purposes of clarity the word "made" is changed to "submitted with this form" and the word "prior" is added before "unrevoked."

In forms 4.13, 4.17 and 4.18, in the caption under the line where the signer's name is to appear, the words "a juristic" are added after the phrase "to sign for," and in the body of forms 4.17 and 4.18, the word "juristic" is added after the phrase "to sign for the." The purpose of these changes is to make clear who is an authorized signer and to provide uniformity with other forms.

In form 4.14, footnote (3) is deleted. The footnote relates to services but this form is not applicable to services because registration of service marks was not available under the acts to which the form pertains. Footnote numbers (4) and (5) are changed to numbers (3) and (4), respectively. Immediately above the signature, the notation footnote (3) (inadvertently omitted) is inserted.

In forms 4.14 and 4.16, in the clause for listing goods or services, the word "recited" is replaced by "stated," to conform to the language of the statute.

Proposed new form 16(a) has been redesignated as form 16 (Combined 8 & 15), in order to coordinate properly with the numbering system used for the forms.

The following changes are made in new form 16 (Combined 8 & 15): after "footnote (5)" in the body of the form, "recited" is replaced by "stated" to conform to the language of the statute; under the space for listing goods, wording is added to accommodate services as well as goods; before "footnote (4)" in the body of the form the wording "or the date of publication under section 12(c) of the act" (inadvertently omitted) is inserted; and after the phrase "that such mark is still in use" the wording "in (3) ———— (Type of commerce) commerce" (inadvertently omitted) is inserted.

Forms 4.17 (Opposition) and 4.18 (Petition to cancel) are made single signature forms by deletion of the provision for signature at the end of the body of the form, leaving a signature only at the end of the verification. This accords with forms for applications, which also require only a single signature at the end of the verification or declaration. In the verification of forms 4.17 and 4.18, the words "the foregoing" (two occurrences) are replaced by the word "this," and the words "and signed" which follow the words "has read" are deleted.

In the parenthetical sentence relating to grounds of damage, the word "he" is changed to "opposer" or "petitioner" in each form, respectively.

In form 4.21, first sentence, "he" is replaced by "said assignor."

In forms 4.21 and 4.22, third paragraph, the letter "s" is deleted from the word "rights." At the end of footnote (2) the wording "changing the word 'applicant' to 'assignee' " is added.

The words "he," "himself" and "his" have been replaced by "he/she," "himself/herself," "his/her" or "it/he/she," as appropriate, in forms 4.1, 4.1a, 4.5, 4.6, 4.13, 4.17, 4.18, 4.21 and 4.22, to give choice of gender.

In form 4.23 (Certificate of mailing), the first line at the bottom is labeled "Print or Type Name of Person Signing Certificate" and the second line is labeled "Signature of Person Signing Certificate," in order to make it clear that in addition to a person's signature, such person's name is to be set out legibly in typing or printing; under the third line, the words "of Signature" are added after "Date" to distinguish the date of signature clearly from the date of deposit which is to be set forth in the body of the form. In the heading of the form, the words "of mailing" are added after "Certificate" for the sake of clarity.

Accordingly, pursuant to the authority contained in section 41 of the act of July 5, 1946, as amended, 37 CFR Part 4 is amended as follows:

1. By revising § 4.1 to read as follows:

§ 4.1 Trademark application by an individual; Principal Register with oath.

Mark ————————————
(Identify the mark)

Class No.————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

.....
(Name of applicant, and business trade name, if any)

.....
(Business address)

.....
(Residence address)

.....
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for the following goods:

_____,

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the Act of July 5, 1946.

The trademark was first used on the goods (2) on ————(Date); was first used in ———— (Type of commerce) commerce (3) on ————(Date); and is now in use in such commerce.

(4)

The mark is used by applying it to (5) ———— and five specimens showing the mark as actually used are presented herewith.

(6)

State of ————
County of ———— } ss.

_____
(Name of applicant)

states that he/she believes himself/herself to be the owner of the trademark sought to be registered; to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

_____
(Signature of applicant)

JURAT:

Subscribed and sworn to before me, this —— day of ————, ——.

_____*
Notary Public

*The person who signs the jurat must be authorized to administer oaths by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.

REPRESENTATION

(See form 4.2 and Note (7) below.)

NOTES

(1) If registration is sought for a word or numeral mark not depicted in any special form, the drawing may be the mark typed in capital letters on letter-size bond paper; otherwise, the drawing shall comply with section 2.52.

(2) If more than one item in a class is set forth and the dates given for that class apply to only one of the items listed, insert the name of the item to which the dates apply.

(3) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign applicants relying upon use must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) If the mark is other than a coined, arbitrary or fanciful mark, and the mark is believed to have acquired a secondary meaning, insert whichever of the following paragraphs is applicable:

(a) The mark has become distinctive of applicant's goods as a result of substantially exclusive and continuous use in ———— (Type of commerce) commerce for the five years next preceding the date of filing of this application.

(b) The mark has become distinctive of applicant's goods as evidenced by the showing submitted separately.

(5) Insert the manner or method of using the mark with the goods, i.e., "the goods," "the containers for the goods," "displays associated with the goods," "tags or labels affixed to the goods," or other method which may be in use.

(6) The required fee of $35.00 for each class must be submitted.

(7) If the applicant is not domiciled in the United States, a domestic representative must be designated. See form 4.4.

2. By revising Section 4.1a to read as follows:

Section 4.1a Trademark application by an individual; Principal Register with declaration.

Mark _____
(Identify the mark)

Class No. _____
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

_____
(Name of applicant, and business trade name, if any)

_____
(Business address)

_____
(Residence address)

_____
(Citizenship of applicant)

The above identified applicant has adopted and is using the trademark shown in the accompanying drawing (1) for the following goods:

_____,

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the Act of July 5, 1946.

The trademark was first used on the goods (2) on ———— (Date) was first used in ———— (Type of commerce) commerce (3) on ———— (Date) and is now in use in such commerce.

(4)

The mark is used by applying it to (5) ———— and five specimens show-

ing the mark as actually used are presented herewith.
(6)

———————————————,
(Name of applicant)

being hereby warned that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any registration resulting therefrom, declares: That he/she believes himself/herself to be the owner of the trademark sought to be registered; that to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as may be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; that the facts set forth in this application are true; and that all statements made of his/her own knowledge are true and all statements made on information and belief are believed to be true.

———————————————
(Signature of applicant)

———————————————
(Date)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

3. By revising Section 4.2 to read as follows:

Section 4.2 Power of attorney at law (which may accompany application).*

Applicant hereby appoints (8) ————, ———— (Address) an attorney at law or attorneys at law, to prosecute this application to register, to transact all business in the Patent and Trademark Office in connection therewith, and to receive the certificate of registration.

NOTE.—(8) An individual attorney at law or individual attorneys at law must be named here. If the name of a law firm is given, it will be regarded merely as a designation of address for correspondence.

*An attorney at law is not required to file a power of attorney; an attorney at law may represent a trademark applicant on the basis of being an attorney at law without presenting a power of attorney.

4. By revising Section 4.5 to read as follows:

Section 4.5 Trademark application by a partnership; Principal Register.

Mark ———————————————
(Identify the mark)
Class No. ———————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

———————————————
(Name of partnership)

———————————————
(Names of partners)

———————————————
(Business address of partnership)

———————————————
(Citizenship of partners)

(Body of application is same as in form 4.1.)

State of ————————
County of ———————— } ss.

———————————————
(Name of partner) states that he/she is a partner of applicant partnership; he/she believes said partnership to be the owner of the trademark sought to be registered; to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

———————————————
(Signature of partner)

JURAT:

Subscribed and sworn to before me, this —— day of ————, —.

———————————————
Notary Public

*The person who signs the jurat must be authorized to administer oaths by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

5. By revising Section 4.6 to read as follows:

Section 4.6 Trademark application by a corporation; Principal Register.

Mark ———————————————
(Identify the mark)
Class No. ———————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

———————————————
(Corporate name and State or country of incorporation) (10)

———————————————
(Business address)

(Body of application is same as in form 4.1.)

State of ————————
County of ———————— } ss.

———————————————
(Name of officer of corporation) states that he/she is ———————— (Official title) of applicant corporation and is authorized to execute this instrument on behalf of said corporation; he/she believes said corporation to be the owner of the trademark sought to be registered; to the best of his/her knowledge and belief no other person, firm, corporation or association has the right to use said mark in commerce, either in the identical form or in such near resemblance thereto as to be likely, when applied to the goods of such other person, to cause

confusion, or to cause mistake, or to deceive; and the facts set forth in this application are true.

_____
(Name of corporation)
By _____
(Signature of officer of corporation, and official title of officer)

JURAT:
Subscribed and sworn to before me, this ——— day of ————, ——.
_____*
Notary Public

*The person who signs the jurat must be authorized to administer oaths by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTE.—(10) If applicant is an association or other collective group, the word "association" or other appropriate designation should be substituted for "corporation" when referring to applicant.

6. By revising Section 4.7 to read as follows:

Section 4.7 Service mark application; Principal Register.

Mark _____
(Identify the mark)
Class No. _____
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5, or 4.6.)

The above identified applicant has adopted and is using the service mark shown in the accompanying drawing (11) for the following services: ————————, and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The service mark was first used in connection with the services (2) on ———————— (Date); was first used in connection with the services rendered in (3) ———— (Type of commerce) commerce on ———————— (Date); and is now in use in such commerce. (4)

The mark is used by _____

_____
(State method of using the mark in connection with the services)
and five (12) ———————— showing the mark as actually used are presented herewith.

(Insert appropriate verification of declaration from form 4.1, 4.1a, 4.5 or 4.6, changing the word "trademark" to "service mark" and the word "goods" to "services.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this from but not set out here, see same numbered Notes under form 4.1.

(11) See Note (1) under form 4.1, and if drawing is not practicable, insert description of the mark instead of reference to the drawing.

(12) Insert "specimens," or state the nature of the representation of the mark which is furnished.

7. By revising Section 4.8 to read as follows:

Section 4.8 Collective mark application (including collective membership mark); Principal Register.

Mark _____
(Identify the mark)
Class No. _____
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert identification of applicant in accordance with form 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the collective mark shown in the accompanying drawing (1) for (13) ———————— (Name the goods or services) to indicate (14) ————————, and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The collective mark was first used on the (2) ———————— (Insert "goods" or "services") (15) by members of applicant on ———————— (Date); was first used by said members in (3) ———————— (Type of commerce) commerce on ———————— (Date); and is now in use in such commerce. (4)

The mark is used by applying it to (16) ———————— and five specimens of the mark as actually used are presented herewith.

(Insert verification from form 4.6 or declaration from form 4.1a, changing the wording as necessary to agree with applicant's legal entity.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(13) If the application is for a membership mark, omit the word "for" and the space for the name of the goods or services.

(14) If the application is for a membership mark, insert "membership in applicant organization," or similar appropriate statement. If not for a membership mark, omit the words "to indicate" and the following space.

(15) If the application is for a membership mark, the phrase "on the goods or services" should be omitted.

(16) For goods, see Note (5); for services, see form 4.7; for membership, insert the manner or method of using the mark to indicate membership, such as membership cards, wall plaques, or other method which may be in use.

8. By revising Section 4.9 to read as follows:

Section 4.9 Certification mark application; Principal Register.

Mark _____
(Identify the mark)
Class No. _____
(A, for Goods; B, for Services)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

The above identified applicant has adopted and is exercising legitimate control over the use of the certification mark shown in the accompanying drawing (1) for the following goods or services:

———————————————,

and requests that said mark be registered in the United States Patent and Trademark Office on the Principal Register established by the act of July 5, 1946.

The certification mark, as used by persons authorized by applicant, certifies (17) ————————; said mark was first used under the authority of applicant on ———————— (Date); was first used in (3) ———————— (Type of commerce) commerce on ———————— (Date); and is now in use in such commerce. (4)

The mark is used by applying it to (5) (or see form 4.7) ————, and five specimens showing the mark as actually used are presented herewith.

Applicant is not engaged in the production or marketing of any goods or services to which the mark is applied.

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6 and add after the word "association" the words "other than those authorized by applicant.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under form 4.1.

(17) Insert an appropriate statement as to what the mark certifies, relating to regional origin, or to material, mode of manufacture, quality, accuracy or other characteristic of the goods or services, or that the work or labor on the goods or in rendering the services was performed by members of applicant.

9. By revising Section 4.10 to read as follows:

Section 4.10 Application based on concurrent use; Principal Register.

Mark ————————————————
(Identify the mark)
Class No. ————————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

Use body of form 4.1, 4.7 or 4.8, and add at the end of the first paragraph: "for the area comprising ———————— (List the States for which registration is sought)"; and add as final paragraph of application:

The following exception(s) to applicant's right to exclusive use are:

By ————, doing business at ————————, who is using the mark ———————— (Identify the mark and Reg. No. or Ser. No., if any) for the following goods (or services): ———————— in the States of ———————— by applying the mark to (16) ———— from ———————— (Earliest known date of such use) to the present.

(Insert appropriate verification of declaration from form 4.1, 4.1a, 4.5 or 4.6 and add after the word "association" the words "other than specified in the application.")

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

For Notes referred to in this form but not set out here, see same numbered Notes under forms 4.1 and 4.8.

10. By revising Section 4.11 to read as follows:

Section 4.11 Application to register on Supplemental Register.

Mark ————————————————
(Identify the mark)
Class No. ————————————————
(If known)

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant in accordance with form 4.1, 4.5 or 4.6.)

For the body of an application for a trademark registration (18), use form 4.1, 4.5 or 4.6, whichever is appropriate, changing the word "Principal" to "Supplemental," and adding a final paragraph to the application as follows:

"The mark sought to be registered has been in lawful use in ———— (Type of commerce) commerce in connection with the goods for the year preceding the date of filing of this application." (19)

(Insert appropriate verification or declaration from form 4.1, 4.1a, 4.5 or 4.6.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1.)

NOTES

(18) For the body of service mark, collective mark or certification mark applications on the Supplemental Register, use form 4.7, 4.8 or 4.9, whichever is applicable, with the change and addition indicated in this form.

(19) If the mark has not been in use for the year next preceding the filing date, and registration in the United States is required as a basis for obtaining foreign protection of the mark, substitute the following statement for the last sentence: The mark sought to be registered is now in use in ———— (Type of commerce) commerce and domestic registration is required as a basis for foreign protection of the mark.

In this instance applicant will be required to make a showing that U.S. registration is required as a basis for foreign protection of the mark.

11. By revising Section 4.13 to read as follows:

Section 4.13 Application for renewal.

Mark ————————————————
(Identify the mark)
Reg. No. ————————————————
Class No. ————————————————

TO THE COMMISSIONER OF PATENTS AND TRADEMARKS:

(Insert appropriate identification of applicant for renewal in accordance with form 4.1, 4.5 or 4.6.)(1)

The above identified applicant for renewal requests that the above identified registration, granted to ———————— (Name of original registrant) on ———————— (Date of Issuance); which applicant for renewal now owns, as shown by records in the Patent and Trademark Office, be renewed in accordance with the provisions of section 9 of the act of July 5, 1946.

The mark shown in said registration is still in use in (2) ———— (Type of com-

merce) commerce on each of the following goods (3) recited in the registration: ———— (List the goods or services or insert the words "all the goods" or "all the services"), the attached specimen (or facsimile) showing the mark as currently used. (4)
(5)

State of ————
County of ———— } ss.

————
(Name of renewal applicant or of person authorized to sign for a juristic renewal applicant) states that to the best of his/her knowledge and belief the facts set forth in this application are true.

————
(Signature of renewal applicant; if renewal applicant is a corporation or other juristic organization, give the official title of the person who signs for renewal applicant)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

(1) Applicant for renewal must be the present owner of the registration.
(2) Type of commerce should be specified as "interstate," "foreign," "territorial," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.
(3) If a service mark registration, state "in connection with each of the following services * * *".
(4) If the mark is not in use in commerce at the time of filing the application for renewal, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances. A specimen (or facsimile) illustrating use, or facts as to nonuse, must be submitted for each class sought to be renewed.
(5) The required fee for renewal sought prior to expiration is $25.00 for each class; and for delayed renewal filed within three months after expiration, an additional $5.00 for each class. If renewal is sought for less than the total number of classes in the registration, the classes for which renewal is sought should be specified.
(6) If applicant for renewal is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not submitted with this form, a prior unrevoked designation will meet the requirement if such is already in the registration file.

12. By revising Section 4.14 to read as follows:

Section 4.14 Affidavit for publication under section 12(c).

Mark ————
(Identify the mark)
Reg. No. ————
Date of Issue ————
To: ————
(Name of original registrant)

State of ————
County of ———— } ss.

————
(Name of registrant or of person authorized to sign for a juristic registrant) states that (1) ———— (Name of registrant) owns the above identified registration, as shown by records in the Patent and Trademark Office; that said registration is now in force; that the mark shown therein is in use in (2) ———— (Type of commerce) commerce on each of the following goods stated in the registration:
———— (List the goods or insert the words "all the goods"), and that the benefits of the act of July 5, 1946, are hereby claimed for said registration.
(3)

————
(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (4) below.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.
(2) Type of commerce should be specified as "interstate," "territorial," "foreign," or other type of commerce which may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.
(3) The required fee of $10.00 must be submitted.
(4) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not submitted with this form, a prior unrevoked designation will meet the requirement if such is already in the registration file.

13. By revising Section 4.15 to read as follows:

Section 4.15 Affidavit required by section 8.

Mark ————
(Identify the mark)
Reg. No. ————
Class No. ————

State of ————
County of ———— } ss.

————
(Name of registrant or of person authorized to sign for a juristic registrant) states that (1) ———— (Name of registrant) owns the above identified registration issued ———— (Date) (2), as shown by records in the Patent and Trademark Office; and that the mark shown therein is still in use (3) as evidenced by (4) ————.
(5)

————
(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (6) below.)

NOTES

The affidavit of which this form is an illustration must be filed within the sixth year after the date of registration under the act of 1946 or after the date of publication under section 12(c) of said act.

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on ———— (Date)".

(3) If the mark is not in use at the time of filing the affidavit, but there is no intention to abandon the mark, facts must be recited to show that the nonuse is due to special circumstances.

(4) Insert "the specimen included showing the mark as currently used," or recite facts as to sales or advertising which will show that the mark is in current use. Specimen illustrating use, or facts as to use or nonuse, are required for each class for which action is sought.

(5) The required fee of $10.00 must be submitted for each class for which action is sought, and if action is sought for less than the total number of classes in the registration, the classes for which action is sought should be specified.

(6) If registrant is not domiciled in the United States, a domestic representative must be designated. See form 4.4. If a designation is not submitted with this form, a prior unrevoked designation will meet the requirement if such is already in the registration file.

14. By revising Section 4.16 to read as follows:

Section 4.16 Affidavit under section 15.

Mark ————————————

(Identify the mark)

Reg. No. ————————————

Class No. ————————————

State of ————————}
County of ————————} ss.

————————————

(Name of registrant or of person authorized to sign for a juristic registrant) states that (1) ———— (Name of registrant) owns the above identified registration issued ———— (Date) (2), as shown by records in the Patent and Trademark Office; that the mark shown therein has been in continuous use in (3) ———— (Type of commerce) commerce for five consecutive years from (4) ———— (Date) to the present, on each of the following goods (5) stated in the registration:

————————————

(List the goods or services or insert the words "all the goods" or "all the services"); that such mark is still in use in (3) ———— (Type of commerce) commerce; that there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register, and that there is no proceeding involving said rights pending and not disposed of either in the Patent and Trademark Office or in the courts.

————————————

(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2.)

NOTES

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on ————(Date)."

(3) Type of commerce must be specified as "interstate," "territorial," "foreign," or such other commerce as may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) The date should be the beginning of a five year period of continuous use, all of which five year period falls after the date of registration under the act of 1946 or after the date of publication under section 12(c). A date which would produce a period of continuous use which is longer than five years may be stated provided the period indicated includes five years of continuous use after registration under the act of 1946 or publication under section 12(c)

(5) If a service mark registration, state: "in connection with each of the following services."

15. By adding a new Section 4.16 (Combined 8 & 15) to read as follows:

Section 4.16 (Combined 8 & 15) Combined affidavit under Sections 8 and 15.

Mark ————————————

(Identify the mark)

Reg. No. ————————————

Class No. ————————————

State of ————————}
County of ————————} ss.

————————————

(Name of registrant or of person authorized to sign for a juristic registrant) states that (1) ———— (Name of registrant) owns the above identified registration issued ———— (Date) (2), as shown by records in the Patent and Trademark Office; that the mark shown therein has been in continuous use in (3) ———— (Type of commerce) commerce for five consecutive years from the date of the registration or the date of publication under section 12(c) (4) to the present, on each of the following goods (5) stated in the registration:

————————————

(List the goods or services or insert the words "all the goods" or "all the services"); that such mark is still in use in (3) ———— (Type of commerce) commerce; that such mark is still in use as evidenced by (6) ———— ; that there has been no final decision adverse to registrant's claim of ownership of such mark for such goods or services, or to registrant's right to register the same or to keep the same on the register, and that there is no proceeding involving said rights pending and not disposed of either in the Patent and Trademark Office or in the courts.

(7)

(Signature; if a corporation or other juristic organization, give the official title of the person who signs.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and note (8) below.)

NOTES

This combined form should not be used with the section 8 portion of the affidavit is based on nonuse.

(1) The present owner of the registration must file the affidavit as registrant.

(2) If the registration issued under a prior act and has been published under section 12(c), add: "and published under section 12(c) on ———— (Date)."

(3) Type of commerce must be specified as "interstate," "territorial," "foreign," or such other commerce as may lawfully be regulated by Congress. Foreign registrants must specify commerce which Congress may regulate, using wording such as commerce with the United States or commerce between the United States and a foreign country.

(4) This form is only appropriate when the five year period of continuous use which is required for section 15 is also the first five years after registration or after publication under section 12(c) which is required for section 8.

(5) If a service mark registration, state: "in connection with each of the following services."

(6) Insert "the specimen included showing the mark as currently used," or recite facts as to sales or advertising which will show that the mark is in current use.

(7) The required fee of $10.00 for section 8 must be submitted for each class for which action is sought, and if action is sought for less than the total number of classes in the registration, the classes for which action is sought should be specified.

(8) If registrant is not domiciled in the United States, a domestic representative must be designated for section 8. See form 4.4. If a designation is not submitted with this form, a prior unrevoked designation will meet the requirement if such is already in the registration file.

16. By revising Section 4.17 to read as follows: Section 4.17 Opposition in the United States Patent and Trademark Office.

In the matter of application Serial No. ————. Published in the Official Gazette on ———— (Date)

———————————

(Name of opposer)

v.

———————————

(Name of applicant)

Opposition No. ———— (To be inserted by Patent and Trademark Office) ———— (Name of opposer), a(n)(1) ———— (Legal entity of opposer), located and doing business at ———— (Address), believes that it/he/she will be damaged by registration of the mark shown in the above identified application, and hereby opposes the same.

As grounds of opposition, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why opposer believes opposer will be damaged.)

(2)

State of ————
County of ———— } ss.

———————————

(Name of opposer or of person authorized to sign for a juristic opposer) states that he/she is the opposer named in this opposition, or is the person authorized to sign for the juristic opposer named in this opposition; that he/she has read the opposition and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he/she believes them to be true.

———————————

(Signature of opposer; if opposer is a corporation or other juristic organization, give the official title of the person who signs for opposer.)

(JURAT) (Use jurat from form 4.1)

REPRESENTATION

(See form 4.2 and Note (7) under from 4.1 For opposers who are foreigners, is is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, state: "an individual," or "an individual trading as ————," if there is a business trade name. If a partnership, state: "a partnership composed of ———— (Names of partners)." If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of ———— (State or country)."

(2) The required fee of $25.00 must be submitted for each class to be opposed, and if opposition is sought for less than the total number of classes, the classes to be opposed should be specified.

17. By revising Section 4.18 to read as follows:

Section 4.18 Petition to cancel a registration in the United States Patent and Trademark Office.

In the matter of Registration No. ————. Date of Issue ————.

———————————

(Name of petitioner)

v.

———————————

(Name of registrant)

Cancellation No. ———— (To be inserted by Patent and Trademark Office) ———— (Name of petitioner), a(n)(1) ———— (Legal entity of petitioner), located and doing business at ———— (Address), believes that it/he/she is or will be damaged by the above identified registration, and hereby petitions to cancel the same.

As grounds therefor, it is alleged that:

(Numbered paragraphs should state the grounds and recite facts tending to show why petitioner believes that petitioner is or will be damaged.)

(2)

State of ————
County of ———— } ss.

———————————————

(Name of petitioner or of person authorized to sign for a juristic petitioner) states that he/she is the petitioner named in this petition to cancel, or is the person authorized to sign for the juristic petitioner named in this petition to cancel; that he/she has read the petition to cancel and knows the contents thereof; and that the allegations are true, except as to the matters stated therein to be upon information and belief, and as to those matters he/she believes them to be true.

———————————————

(Signature of petitioner to cancel; if petitioner is a corporation or other juristic organization, give the official title of the person who signs for petitioner.)

(JURAT) (Use jurat from form 4.1.)

REPRESENTATION

(See form 4.2 and Note (7) under form 4.1. For petitioners who are foreigners, it is customary to regard a power of attorney as the equivalent of a domestic representative.)

NOTES

(1) If an individual, states: "an individual," or "an individual trading as ————— ." if there is a business trade name. If a partnership, state: "a partnership composed of ————— (Names of partners)." If a corporation, association, or other organization, state "a corporation (or specify other type of organization) organized and existing under the laws of ————— (State or country)."

(2) The required fee of $25.00 must be submitted for each class sought to be cancelled, and if cancellation is sought for less than the total number of classes, the classes sought to be cancelled should be specified.

18. By revising Section 4.21 to read as follows: Section 4.21 Assignment of application.

Whereas ————— (Name of assignor), of ————— (Address), has adopted and is using a mark for which said assignor has filed application in the United States Patent and Trademark Office for registration, Serial No. ————; and

Whereas ————— (Name of assignee), of (1) ————— (Address), is desirous of acquiring said mark;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said ————— (Name of Assignor) does hereby assign unto the said ————— (Name of assignee) all right, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified application for registration of said mark.

(2)

The Commissioner of Patents and Trademarks is requested to issue the certificate of registration to said assignee.

———————————————

(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of ————— }
County of ————— } ss.

On this —— day of ————, ——, before me appeared ————, the person who signed this instrument, who acknowledged that he/she signed it as a free act on his/her own behalf (or on behalf of the identified corporation or other juristic entity with authority to do so).

———————————————*
Notary Public

*(The wording of the acknowledgement may vary from this illustration but should be wording acceptable under the law of the jurisdiction where executed; the person who signs the acknowledgement must be authorized to do so by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

NOTES

(1) If the postal address of the assignee is not given either in the instrument or in an accompanying paper, registration to the assignee may be delayed.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See form 4.4, changing the word "applicant" to "assignee."

19. By revising Section 4.22 to read as follows:

Section 4.22 Assignment of registration.

Whereas ————— (Name of assignor), of ————— (Address), has adopted, used and is using a mark which is registered in the United States Patent and Trademark Office, Registration No. ————, dated ————; and

Whereas ————— (Name of assignor), of ————— (Address), is desirous of acquiring said mark and the registration thereof;

Now, therefore, for good and valuable consideration, receipt of which is hereby acknowledged, said ————— (Name of assignor) does hereby assign unto the said ————— (Name of assignee) all right, title and interest in and to the said mark, together with the good will of the business symbolized by the mark, and the above identified registration thereof.

(2)

———————————————

(Signature of assignor; if assignor is a corporation or other juristic organization, give the official title of the person who signs for assignor.)

State of ————— }
County of ————— } ss.

On this —— day of ————, ——, before me appeared ————, the person who signed this instrument, who acknowledged that he/she signed it as a free act on his/her own behalf (or on behalf of the identified corporation or other juristic entity with authority to do so).

———————————————*
Notary Public

*(The wording of the acknowledgement may vary from this illustration but should be wording acceptable under the law of the jurisdiction where executed; the person who signs the acknowledgement must be authorized to do so by the law of the jurisdiction where executed, and the seal or stamp of the notary, or other evidence of authority in the jurisdiction of execution, must be affixed.)

NOTES

(1) If the postal address of the assignee is not given either in the instrument of in an accompanying paper, recording may be delayed pending receipt of such address.

(2) If assignee is not domiciled in the United States, a domestic representative must be designated. See form 4.4, changing the word "applicant" to "assignee."

20. By revising Section 4.23 to read as follows:

Section 4.23 A suggested format for the certificate of mailing under 37 CFR 1.8(a) to be included with the correspondence.

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, D.C. 20231, on ———————— (Date of Deposit).

Print or Type Name of Person Signing Certificate

Signature of Person Signing Certificate

Date of Signature

The Patent and Trademark Office has determined that these rule changes have no potential major economic consequences requiring the preparation of a regulatory analysis under Executive Order 12044.

Dated: September 18, 1978.

DONALD W. BANNER,
Commissioner of Patents and Trademarks.

Approved: November 21, 1978.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

Dated: November 21, 1978.

[FR Doc. 78-33269 Filed 11-27-78; 8:45 am]

(43 FR 55395, Nov. 28, 1978)

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT including the amounts of the fees thereunder and the States that may be designated in International applications consult the Notice entitled "Patent Cooperation Treaty (PCT) : Information for Prospective Applicants" appearing in the OFFICIAL GAZETTE of October 3, 1978.

DONALD W. BANNER,
Nov. 7, 1978. *Commissioner of Patents and Trademarks.*

Looseleaf Trademark Rules of Practice

The November 7, 1978 Official Gazette notice entitled "Looseleaf Rules of Practice in Patent and Trademark Cases" is hereby amplified to include another source if only the trademark rules are desired. In addition to the Rules Service Company, whose address is listed in the previous O.G. Notice, the Trademark Rules of Practice in looseleaf form can be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, for $5.00 for domestic subscriptions and $6.25 for foreign mailing. The trademark rules are available only by subscription. Any revisions in the rules will be reflected in updates mailed automatically as part of the subscription.

PATRICIA M. DAVIS,
Nov. 28, 1978. *Acting Assistant Commissioner for Trademarks.*

Board of Appeals Decisions Rendered in the Month of November 1978

Affirmed	181
Affirmed in Part	23
Reversed	76
Total	280

Trademark Manual of Examining Procedure (Renewal and Revisions)

The subscription price for the Trademark Manual of Examining Procedure (TMEP) has been changed by the U.S. Government Printing Office. As of November 14, 1978, the price for a new subscription is $21.00 domestic ($26.25 for foreign mailing). New subscriptions include the basic manual text plus the first four revisions, and supplement service for future revisions until notice of change. New subscriptions may be ordered from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Renewal notices, effective with Revision 5, are now being sent to current subscribers by the Government Printing Office. The renewal fee for continuation of supplement service is $7.50 domestic ($9.50 for foreign mailing). The renewal fee is payable upon receipt of notice thereof to assure delivery of Revision 5 and revisions thereafter.

Rev. 4 of the Trademark Manual of Examining Procedure will be distributed to subscribers by the Government Printing Office about January 1, 1979. (Rev. 1 was issued in Jan. 1976; Rev. 2 in Jan. 1977; and Rev. 3 in Jan. 1978.)

Previous notices regarding the Trademark Manual of Examining Procedure appeared in the Official Gazettes of June 25, 1974 (923 O.G. TM 204) and June 1, 1976 (947 O.G. TM 2).

SAUL LEFKOWITZ,
Date: Dec. 1, 1978. *Acting Assistant Commissioner for Trademarks.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,925,719, Robbins and Linn, REFRIGERATING PACKAGE, **filed** Oct. 17, 1977, D.C. Conn. (New Haven), Doc. N–77–402, *Kay Laboratories, Inc.* v. *Hospital Marketing Services Co., Inc.* Mutual stipulation of dismissal and release filed by parties. Order dismissing action with prejudice entered Jan. 23, 1978.

2,936,704, T. Hense, HIGH SPEED PRINTING APPARATUS, **filed** Apr. 19, 1977, D.C., W.D. Va. (Roanoke), Doc. 77–0069, *Olympia Werke Aktiengesellschaft* v. *General Electric Company.*

2,945,666, Freeman and Vaudreuil, BALL VALVE, **filed** Feb. 10, 1976, D.C. Conn. (Hartford), Doc. H–76–79, *Jamesbury Corp.* v. *Litton Industrial Products, Inc.* Judgment entered for the defendant on Nov. 30, 1977.

2,978,213, B. H. Kass, VIBRATION ISOLATION ARRANGEMENTS, **filed** Aug. 26, 1975, D.C., N.D.N.Y. (Utica), Doc. 75–CV–425, *G. A. Braun, Inc.* v. *Machinery Mountings, Inc.* Order of dismissal, Jan. 18, 1978.

2,998,817, L. L. Armstrong, INFLATABLE MASSAGING AND COOLING MATTRESS, **filed** Apr. 6, 1977, D.C. Mass. (Boston), Doc. C.A. 77–981–C, *Arnold Agulnick and Malcolm R. Harris* v. *American Hospital Supply Corp. et al.*

3,006,186, T. L. Berry, FREE POINT INDICATOR FOR DETERMINING THE POINT AT WHICH STUCK PIPE IS FREE IN A WELL, **filed** Sept. 9, 1977, D.C., E.D. La. (New Orleans), Doc. 77–2763, *Dia-Log Company* v. *Cruther Resources Corporation et al.*

3,036,358, L. Scaglia, METHOD AND APPARATUS FOR REMOVING YARN RESIDUE FROM SPOOLS, **filed** May 26, 1978, D.C., W.D.N.C. (Charlotte), Doc. C–C–78–0155, *M. Scaglia, S.p.A.* v. *F. Gordon Cobb.* **Same, filed** Feb. 2, 1977, D.C., W.D.N.C. (Charlotte), Doc. C–C–77–29, *M. Scaglia, S.p.A.* v. *Air Knife, Inc.*

3,074,301, L. M. Carpenter, WIRE STRIPPER, **filed** July 12, 1977, D.C.N.J. (Newark), Doc. 77–1401, *Carpenter Manufacturing Co., Inc.* v. *William Leonhardt.* Order of dismissal, July 13, 1977.

3,086,528, Eichelman and Smiley, INTERMITTENT VACUUM REGULATOR, **filed** Dec. 6, 1974, D.C., N.D. Ill. (Chicago), Doc. 74c3528, *Chemetron Corporation* v. *Airco Inc.* Plaintiff's motion to dismiss with prejudice in accordance with Rule 41, Fed. R. Civ. P. granted, June 10, 1977.

3,171,728, W. Anderson, METHOD OF ELIMINATION OF SETTLE-BLOW IN MAKING BOTTLE; **3,171,729,** same, METHOD OF MAKING A PARISON; **3,171,732,** same, GLASS BOTTLE PARISON MACHINE, **filed** Aug. 4, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c3114, *Virginia Kremm* v. *Ball Corporation.*

3,171,729. (See 3,171,728.)

3,171,732. (See 3,171,728.)

3,172,892, Le Suer and Norman, REACTION PRODUCT OF HIGH MOLECULAR WEIGHT SUCCINIC ACIDS AND SUCCINIC ANHYDRIDES WITH AN ETHYLENE POLYAMINE; **3,272,743,** same, LUBRICANTS CONTAINING METAL-FREE DISPERSANTS AND METALLIC DISPERSANTS; **3,272,746,** same, LUBRICATING COMPOSITION CONTAINING AN ACYLATED NITROGEN COMPOUND, **filed** May 12, 1977, D.C., N.D. Calif. (San Francisco), Doc. C–77–1002–CFP, *Chevron Research Company* v. *The Lubrizol Corporation.*

3,220,960, Wichterle and Lim, CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM; **3,822,089,** O. Wichterle, ANHYDROUS SPARINGLY CROSS-LINKED HYDROPHILIC COPOLYMERS; **3,361,858,** O. Wichterle, REMOVAL AND SWELLING TO FORM A HYDROGEL CONTACT LENS; **Re. 27,401,** Wichterle and Prague, CROSS-LINKED HYDROPHILIC POLYMERS AND ARTICLES MADE THEREFROM, **filed** Jan. 17, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c172, *National Patent Development Corp. and Flexible Contact Lens* v. *Continuous Curve Contact Lenses, Inc., Soft Lenses, Inc. and House of Vision, Inc.* **Same, filed** Aug. 23, 1974 D.C. Colo. Doc. 74–M–761, *Czechoslovak Academy of Science* v. *Automated Optics, Inc.* This matter was dismissed upon the filing of a stipulation, Aug. 30, 1977.

3,227,886, Dunigan and Scwerdt, PHOTOELECTRIC ARTICLE CODING AND CLASSIFYING DEVICE, **filed** Nov. 7, 1977, United States Court of Claims, Washington, D.C., Doc. 539–77, *Mekontrol, Inc.* v. *The United States.*

3,239,070, A. D. Clauson, HAND ROD ASSEMBLY, **filed** Aug. 16, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c3273, *Capitol Hardware Manufacturing Company* v. *Garcy Corp.*

3,247,692, P. K. Davis, PIPE MAKING MACHINE AND METHOD, **filed** Feb. 21, 1978, D.C., N.D. Calif. (San Francisco), Doc. C78–383 SAW, *Pacific Roller Die Co., Inc.* v. *Boyken, Mohler and Wood.* It is therefore hereby ordered that the plaintiff's motion be and the same is hereby granted, Feb. 22, 1978.

3,264,877, P. E. Boxrud, SOIL SAMPLING DEVICE, **filed** Feb. 7, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c437, *Outboard Marine Corporation* v. *Roseman Tractor Equipment Co.*

3,267,556, H. D. Scharf, WIRE PROCESSING AND TERMINAL AFFIXING MACHINE, **filed** May 26, 1978, D.C., E.D. Wis. (Milwaukee), Doc. 78–331, *Herbert D. Scharf* v. *Artos Engineering Company, Inc.*

3,267,934, W. E. Thornton, ELECTROCARDIAC COMPUTER, **filed** Aug. 9, 1978, D.C., W.D. Wash. (Seattle), Doc. C78–466V, *Del Mar Avionics* v. *Quinton Instruments Company.*

3,272,743. (See 3,172,892.)

3,272,746. (See 3,172,892.)

3,334,067, D. R. Weyenberg, METHOD OF MAKING ONE COMPONENT ROOM TEMPERATURE CURING SILOXANE RUBBERS, **filed** Sept. 15, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3440, *Dow Corning Corporation* v. *General Electric Company.*

3,361,858. (See 3,220,960.)

3,372,958, R. R. Black, AUTOMATIC FEEDER FOR PNEUMATIC CONVEYING LINES, **filed** Feb. 8, 1978, D.C., W.D. Wash. (Seattle), Doc. C78–95 V, *Cyclonaire Corporation* v. *Airkonvey, Inc.*

3,386,955. Nawakowsi and Wang and Schiller, SUBSTITUTED UREAS AS LOW TEMPERATURE EPOXY CURING AGENTS, **filed** Jan. 19, 1978, D.C. Del. (Wilmington), Doc. C.A. 78–22, *American Cyanamid Company* v. *Minnesota Mining and Manufacturing Company.*

3,398,984, F. S. Ajero, MOTOR VEHICLE WITH LATERALLY ADJUSTABLE CAB, **filed** June 2, 1977, United States Court of Claims, Washington, D.C., Doc. 309–77, *Kornylak Corporation* v. *The United States.*

3,416,763, A. M. Moreno, DEVICE FOR TENSIONING STRAPS, WIRES, OR LIKE FLEXIBLE ELEMENTS, **filed** Jan. 7, 1972, D.C., M.D. Fla. (Jacksonville), Doc. 72–10–C–J, *Albert M. Moreno* v. *W. C. Tyson, doing business as Northeast Florida Mobile Home Anchors.* Counterclaim is dismissed with prejudice, Feb. 9, 1978.

3,424,189, J. C. Woodford, SELF-DRAINING SILL COCK AND VACUUM BREAKER, **filed** Nov. 1, 1977, D.C., N.D. Ind. (South Bend), Doc. S77–0192, *Woodford Manufacturing Company* v. *Josam Manufacturing Co.*

3,425,968, T. L. Reiling, NON-CURLING GUMMED COATED PAPER, METHOD AND COMPOSITION FOR MAKING THE SAME, **filed** June 14, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c2133, *Thomas L. Reiling* v. *Beatrice Foods Company.* Status hearing held, by agreement, cause dismissed with prejudice, May 26, 1978.

3,440,525, C. P. Cardeiro, pH METER AND CONTROL SYSTEM, **filed** May 4, 1978, D.C., N.D. Ill. (Chicago), Doc. 78c1749, *Uniloc Inc.* v. *Beckman Instruments, Inc.*

3,499,380, N. L. Gongwer, AUTOMATIC FOOD COOKING MACHINE, **filed** Aug. 2, 1978, D.C., N.D. Ind. (South Bend), Doc. S78–0166, *Nelson L. Gongwer* v. *Mark Stitt.*

3,822,089. (See 3,220,960.)

Re. 27,401. (See 3,220,960.)

National Inventors Day

The Patent and Trademark Office, along with the National Council of Patent Law Associations, will co-sponsor National Inventors Day in the Public Search Room on Saturday, February 10, from 1:00 p.m. to 5:00 p.m. and Sunday, February 11, 1979 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days and to attend the dedication of the National Inventors Hall of Fame and the induction of four inventors into the Hall of Fame at 1:00 p.m. on Sunday, February 11.

In order to accommodate the exhibits, it will be necessary to close the Public Search Room at 5:00 p.m. on Friday, February 9, 1979.

We would appreciate the cooperation of all users of the Search Room facilities by removing all personal properties and items for the early closing.

LUTRELLE F. PARKER,
For DONALD W. BANNER,
Dec. 7, 1978. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,524,255, Re. S.N. 938,263, Filed Aug. 30, 1978, Cl. 32/13, METHOD OF ATTACHING A TOOTH CROWN TO A TOOTH ROOT, Peter Frank Kurer, Owner of Record: *Inventor,* Attorney or Agent: Louis Orenbuch, Ex. Gp.: 333

3,730,483, Re. S.N. 941,333, Filed Sep. 8, 1978, Cl. 254/150 R, ASSEMBLY FOR PULLING A LINE, E. Strohm Newell, Owner of Record: *Inventor,* Attorney or Agent: Neil F. Markva, Ex. Gp.: 315

3,779,907, Re. S.N. 951,352, Filed Oct. 13, 1978, Cl. 210/22, LIQUID MEMBRANE PROCESS FOR THE SEPARATION OF AQUEOUS MIXTURES, Norman N. Li, et al., Owner of Record: *Exxon Research and Engineering Company, Linden, N.J.,* Attorney or Agent: Jerome E. Luecke, Ex. Gp.: 176

3,835,767, Re. S.N. 953,499, Filed Oct. 23, 1978, Cl. 100/53, REFUSE COMPACTOR, Robert A. Peterson, Owner of Record: *Inventor,* Attorney or Agent: Frederick E. Mueller, Ex. Gp.: 242

3,835,769, Re. S.N. 953,500, Filed Oct. 23, 1978, Cl. 100/227, REFUSE COMPACTOR, Robert A. Peterson, Owner of Record: *Inventor,* Attorney or Agent: Frederick E. Mueller, Ex. Gp.: 242

3,872,274, Re. S.N. 955,208, Filed Oct. 26, 1978, Cl. 200/157, OFF LOCKING IN-LINE TRIGGER SWITCH, Earl T. Piber, Owner of Record: *Cutler-Hammer, Inc., Milwaukee, Wis.,* Attorney or Agent: Hugh R. Rather, et al., Ex. Gp.: 241

3,893,869, Re. S.N. 950,168, Filed Oct. 10, 1978, Cl. 134/86, MEGASONIC CLEANING SYSTEM, Alfred Mayer, et al., Owner of Record: *RCA Corporation, New York, N.Y.,* Attorney or Agent: H. Christoffersen, Ex. Gp.: 242

3,964,519, Re. S.N. 952,695, Filed Oct. 19, 1978, Cl. 138/37, FLUID VELOCITY EQUALIZING APPARATUS, Kenneth W. De Baun, Owner of Record: *Air Monitor Corporation, Santa Rosa, Calif.,* Attorney or Agent: James F. Mitchell, Ex. Gp.: 243

3,976,364, Re. S.N. 935,958, Filed Aug. 23, 1978, Cl. 350/179, OPTICAL AIR LENS SYSTEM, Harley Burke Lindemann, et al., Owner of Record: *Inventor,* Attorney or Agent: Douglas B. Henderson, et al., Ex. Gp.: 257

3,979,689, Re. S.N. 954,614, Filed Oct. 25, 1978, Cl. 330/257, DIFFERENTIAL AMPLIFIER CIRCUIT, Otto Heinrich Schade, Jr., Owner of Record: *RCA Corporation, Princeton, N.J.,* Attorney or Agent: H. Christoffersen, et al., Ex. Gp.: 252

4,000,042, Re. S.N. 939,428, Filed Sep. 5, 1978, Cl. 195/103.5 R, DIAGNOSTIC REAGENT FOR THE DETERMINATION OF AMYLASE, Thomas H. Adams, Owner of Record: *E. I. du Pont de Nemours and Company, Wilmington, Del.,* Attorney or Agent: James L. Jersild, Ex. Gp.: 172

4,010,575, Re. S.N. 952,571, Filed Oct. 18, 1978, Cl. 51/229, DEVICE FOR GRINDING A CABACHON, Henry L. Henry, Owner of Record: *Geode Industries Inc., New London, Iowa,* Attorney or Agent: Haven E. Simmons, et al., Ex. Gp.: 323

4,015,633, Re. S.N. 951,968, Filed Oct. 16, 1978, Cl. 138/89, ASSEMBLY FOR SEALING AND PRESSURE EQUALIZATION OF A SUBMERSIBLE HOUSING, Ronald D. Mandell, Owner of Record: *Sta-Rite Industries, Inc., Delavan, Wis.,* Attorney or Agent: Richard D. Mason, et al., Ex. Gp.: 243

4,018,204, Re. S.N. 947,713, Filed Oct. 2, 1978, Cl. 123/198 F, FUEL SAVING APPARATUS FOR MULTIPLE CYLINDER INTERNAL COMBUSTION ENGINES, Earl W. Rand, Jr., Owner of Record: *Inventor,* Attorney or Agent: Claude A. Fishburn, et al., Ex. Gp.: 342

4,050,042, Re. S.N. 954,669, Filed Oct. 25, 1978, Cl. 335/212, STATIC CONVERGENCE DEVICES FOR COLOR TELEVISION PICTURE TUBES, Albert M. Anthony, Owner of Record: *Tracor, Inc., Austin, Tex.,* Attorney or Agent: Francois N. Palmatier, Ex. Gp.: 212

4,054,595, Re. S.N. 955,005, Filed Oct. 26, 1978, Cl. 560/121, 18 OR 19 HYDROXY PROSTAGLANDINS, Arthur Friedrich Marx, et al., Owner of Record: *Gist-Brocades N.V., Delft, Holland,* Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 126

4,079,529, Re. S.N. 953,283, Filed Oct. 20, 1978, Cl. 38/102.2, DEVICES FOR THE FOLD-FREE STRETCHING AND HOLDING OF LIQUID CRYSTAL FILMS, Friedrich Jennen, et al., Owner of Record: *Troponwerke Dinklage & Company, Koeln, Germany,* Attorney or Agent: Arnold Sprung, et al., Ex. Gp.: 353

4,091,785, Re. S.N. 955,084, Filed Oct. 26, 1978, Cl. 123/140 R, FUEL CONTROL CROSS SHAFT, Alvin W. Montgomery, Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, Ex. Gp.: 342

PATENT NOTICES

Certificates of Correction for the Week of Dec. 26, 1978

3,921,105	4,089,807	4,095,890	4,114,196
3,961,529	4,090,578	4,096,210	4,114,434
3,974,068	4,090,997	4,096,262	4,114,437
4,049,811	4,091,653	4,096,568	4,114,451
4,076,748	4,091,822	4,096,609	4,114,452
4,078,799	4,091,900	4,096,932	4,116,103
4,081,313	4,092,401	4,097,074	4,116,182
4,081,932	4,092,402	4,097,322	4,116,211
4,081,941	4,092,733	4,097,392	4,116,311
4,082,453	4,093,091	4,099,019	4,116,774
4,082,616	4,093,544	4,099,247	4,117,292
4,082,694	4,093,805	4,099,741	4,117,721
4,085,952	4,094,460	4,099,790	4,117,901
4,086,051	4,094,567	4,099,936	4,117,916
4,087,478	4,095,058	4,100,391	4,118,148
4,087,842	4,095,073	4,100,552	4,118,177
4,088,655	4,095,145	4,100,746	4,118,245
4,088,658	4,095,450	4,101,356	4,118,246
4,088,781	4,095,536	4,113,461	4,118,407
4,088,855	4,095,603	4,113,951	4,119,834
4,089,464	4,095,656	4,114,139	

Disclaimers

3,388,522.—*Frederick J. Lowes,* Midland, Mich. AIRCRAFT STIFFENING SECTION. Patent dated June 18, 1968. Disclaimer filed Oct. 12, 1978, by the assignee, *The Dow Chemical Company.*

Hereby enters this disclaimer to claims 2 and 3 of said patent.

3,561,934.—*Gary Steven,* Pittsburgh, Pa. SINTERED STEEL PARTICLES CONTAINING DISPERSED CARBIDE. Patent dated Feb. 9, 1970. Disclaimer filed May 4, 1978, by the assignee, *Crucible, Inc.*

Hereby enters this disclaimer to claims 1–3 and 6 of said patent.

3,673,875.—*John T. Kasselmann,* Southfield, Mich. HYDRAULIC RATE GYRO FOR AN ADAPTIVE STEERING SYSTEM. Patent dated July 4, 1972. Disclaimer filed Oct. 6, 1978, by the assignee, *The Bendix Corporation.*

Hereby enters this disclaimer to claims 1 through 6 of said patent.

3,961,182.—*William E. Spicer,* Stanford, Calif. PICK UP SCREENS FOR X-RAY IMAGE INTENSIFIER TUBES EMPLOYING EVAPORATED ACTIVATED SCINTILLATOR LAYER. Patent dated June 1, 1976. Disclaimer filed Aug. 28, 1978, by the assignee, *Varian Associates, Inc.*

The term of this patent subsequent to March 5, 1991 has been disclaimed.

3,961,953.—*Richard P. Millonzi* and *Richard W. Radler,* Marion, N.Y. METHOD OF FABRICATING COMPOSITE TRIGONAL SELENIUM PHOTORECEPTOR. Patent dated June 8, 1976. Disclaimer filed Sept. 14, 1978, by the assignee, *Xerox Corporation.*

Hereby enters this disclaimer to claims 3 and 4 of said patent.

4,051,228.—*Helmut Knorre,* Seligenstadt, *Joachim Fischer* and *Gerhard Pohl,* Hanau, Germany. PREVENTING CAKING AND OBTAINING FLOWABILITY OF ALKALI CHLORIDES AND SALT MIXTURES THEREOF. Patent dated Sept. 27, 1977. Disclaimer filed Nov. 15, 1978, by the assignee, *Deutsche Gold- und Silber-Scheideanstalt vormals Roessler.*

The term of this patent subsequent to September 14, 1993 has been disclaimed.

Patents Available for Licensing or Sale

3,863,243. SLEEP ALARM FOR DRIVERS. Max Skolnick, 19–30 Parson Blvd., Whitestone, N.Y. 11357.

3,973,864. TIDE MOTOR. Dewitt T. Atherton, 407 West E St., Encinitas, Calif. 92024.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the patents listed below. Inquiries respecting licenses under RCA patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

4,118,598. AMPLITUDE MODULATED IMPATT DIODE OSCILLATOR AND A LOW COST COMMUNICATION SYSTEM USING SAME.

4,118,649. TRANSDUCER ASSEMBLY FOR MEGASONIC CLEANING.

4,118,656. NORTH-SOUTH PINCUSHION DISTORTION CORRECTION CIRCUIT.

4,118,700. SINGLE WIRE TRANSMISSION OF MULTIPLE SWITCH OPERATIONS.

4,118,729. SET-UP ARRANGEMENT FOR A COLOR TELEVISION RECEIVER.

4,118,731. VIDEO AMPLIFIER WITH SUPPRESSED RADIO FREQUENCY RADIATION.

4,119,807. DIGITAL TIME DIVISION MULTIPLEX SWITCHING SYSTEM.

4,119,812. SIGNAL DEFECT DETECTION AND COMPENSATION WITH SIGNAL DEEMPHASIS.

4,119,864. TOUCH SWITCH CIRCUITS.

4,119,882. CATHODE FOR FLAT PANEL DISPLAY.

4,119,924. SWITCHABLE CURRENT AMPLIFIERS.

4,119,925. FREQUENCY SYNTHESIZER WITH FREQUENCY MODULATED OUTPUT.

4,119,945. ERROR DETECTION AND CORRECTION.

4,119,961. CCD BINARY-TO-GRAY CODE GENERATOR.

4,119,992. INTEGRATED CIRCUIT STRUCTURE AND METHOD FOR MAKING SAME.

4,120,001. SYSTEM FOR PASSING TWO COLOR TV SIGNALS THROUGH NON-LINEAR PATH.

4,120,044. DATA ENCODING KEYBOARD.

4,120,567. ELECTRO-OPTIC DEVICE.

4,121,130. CATHODE STRUCTURE AND METHOD OF OPERATING THE SAME.

4,121,137. SYSTEM FOR ACHIEVING IMAGE UNIFORMITY IN DISPLAY DEVICES.

4,121,211. METHOD AND APPARATUS FOR DETERMINING A SIGNAL OF UNIFORM PERIOD.

4,121,257. CATHODE-RAY TUBE WITH DOUBLE TENSION BAND.

4,121,881. DUPLICATING A HOLOGRAPHIC RECORD BY USING TWO REFERENCE BEAMS.

4,122,368. CATHODE-RAY TUBE WITH A CORRUGATED MASK HAVING A CORRUGATED SKIRT.

4,122,400. AMPLIFIER PROTECTION CIRCUIT.

4,122,410. LATERAL MODE CONTROL IN SEMICONDUCTOR LASERS.

4,122,415. AM TRANSMITTER WITH AN OFFSET VOLTAGE TO THE RF STAGE TO COMPENSATE FOR SWITCHING TIME OF THE MODULATORS.

4,122,416. SHIELDED, D.C. ISOLATED RF CONNECTOR ASSEMBLY.

4,122,453. ANTENNA FEED NETWORK.

4,122,483. SEMICONDUCTOR DEVICE HAVING REDUCED LEAKAGE CURRENT.

4,122,485. METHOD AND APPARATUS FOR SIMULATING MAGNETIC ENVIRONMENT OF TELEVISION RECEIVERS.

4,122,489. SIGNAL DEFECT COMPENSATOR.

4,123,302. METHOD FOR DEPOSITING EPITAXIAL SEMICONDUCTOR FROM THE LIQUID PHASE.

4,123,713. MEMORY TYPE TUNING SYSTEM WITH PROVISIONS TO FACILITATE SETUP.

4,123,776. SERVICE SWITCH ARRANGEMENT FOR A COLOR TELEVISION RECEIVER.

4,123,779. TURNTABLE ROTATIONAL SPEED AND PHASE CONTROL SYSTEM FOR A VIDEO DISC PLAY/RECORD APPARATUS.

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

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Requests for licensing information on a particular invention should be directed to the address cited for the agency-sponsor.

DOUGLAS J. CAMPION,
Patent Program Coordinator,
National Technical Information Service.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Services Division, Federal Building, Agricultural Research Service Hyattsville, Md. 20782

Patent application 880,734. Automatic Astroposition Determination Apparatus. Filed Feb. 24, 1978.

Patent 4,053,712. Adaptive Digital Coder and Decoder. Filed Aug. 24, 1976. Patented Oct. 11, 1977. Not available NTIS.

Patent 4,055,079. Cylinder Firing Indicator. Filed Aug. 9, 1976. Patented Oct. 25, 1977. Not available NTIS.

Patent 4,056,852. Adjustable Helmet Suspension System. Filed Apr. 19, 1976. Patented Nov. 8, 1977. Not available NTIS.

Patent 4,058,438. Rapid Universal Sensing Cell. Filed Oct. 28, 1976. Patented Nov. 15, 1977. Not available NTIS.

Patent 4,059,052. Fuze Modulation System. Filed Feb. 21, 1957. Patented Nov. 22, 1977. Not available NTIS.

Patent 4,062,126. Deadband Error Reduction in Target Sight Stabilization. Filed Nov. 8, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,062,598. Wedge Block Lock for Vehicle Track End Connectors. Filed Aug. 9, 1976. Patented Dec. 13, 1977. Not available NTIS.

Patent 4,069,990. Ring-Wing Canard Spin-Up Control Mechanism. Filed Mar. 14, 1977. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,070,692. Video Digitizing System for Single Valued Functions. Filed May 8, 1975. Patented Jan. 24, 1978. Not available NTIS.

Patent 4,079,955. Locking Device. Filed Aug. 9, 1976. Patented Mar. 21, 1978. Not available NTIS.

Patent 4,080,942. Metering Fuel by Compressibility. Filed June 23, 1976. Patented Mar. 28, 1978. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St. SW., Washington, D.C. 20324

Patent application 893,867. Gun Projectile Sensor. Filed Apr. 6, 1978.

Patent application 904,850. Turbofan Augmentor Flameholder. Filed May 11, 1978.

Patent application 904,964. Metallic Grating Spatial Filter for Directional Beam Forming Antenna. Filed May 11, 1978.

Patent application 904,965. Gating Apparatus for Static Crossed Field Photomultipliers. Filed May 11, 1978.

Patent application 905,063. Wing Pivot Assembly for Variable Sweep Wing Aircraft. Filed May 11, 1978.

Patent application 910,996. A Planar Thin Film Edge Contact Metal Oxide-Metal Device. Filed May 30, 1978.

Patent application 913,187. Low Contrast Measurement Apparatus. Filed June 6, 1978.

Patent application 915,708. Attitude Indicator Comparator Warning System. Filed June 15, 1978.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St., Washington, D.C. 20240

Patent application 916,080. A Passive DABS-CAS Design. Filed June 16, 1978.

U.S. DEPARTMENT OF THE NAVY

Assistant Chief for Patents, Office of Naval Research Code 302, Arlington, Va. 22217

Patent application 831,278. Range Division Multiplexing. Filed Sept. 2, 1977.

Patent application 861,156. Very Low Frequency Sonobuoy (VLF Sonobuoy) Assignment. Filed Dec. 16, 1977.

Patent application 890,891. Method for Optically Distorting Readout Reticles. Filed Mar. 28, 1978.

Patent application 894,283. Global Neutrino Communication System. Filed Apr. 7, 1978.

Patent application 902,128. Safe/Arm Firing Device. Filed May 2, 1978.

Patent application 905,304. Sweeping Noise Blanker. Filed May 12, 1978.

Patent 4,075,622. Variable-to-Block-With-Prefix Source Coding Technique. Filed Jan. 31, 1975. Patented Feb. 21, 1978. Not available NTIS.

Patent 4,079,309. Method for Determining Changes in Earth Resistivity by Measuring Phase Difference Between Magnetic Field Components. Filed Sept. 3, 1976. Patented Mar. 14, 1978. Not available NTIS.

Patent 4,081,214. Low Altitude Optical Altimeter. Filed July 6, 1976. Patented Mar. 28, 1978. Not available NTIS.

Patent 4,083,249. Hygrometer. Filed Jan. 17, 1977. Patented Apr. 11, 1978. Not available NTIS.

Patent 4,084,512. Pressure Relief Construction for Controlled Combustion of Ordnance Items. Filed Oct. 18, 1976. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,084,781. Fabrication of Ablator Liners in Combustors. Filed Mar. 28, 1977. Patented Apr. 18, 1978. Not available NTIS.

Patent 4,086,491. Direct Measurement of the Electron Beam of a Scanning Electron Microscope. Filed Feb. 4, 1977. Patented Apr. 25, 1978. Not available NTIS.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

Assistant General Counsel for Patent Matters, NASA Code GP–2, Washington, D.C. 20546

Patent application 928,130. A Phase Insensitive Ultrasonic Transducer. Filed July 26, 1978.

Patent application 928,132. Microstrip Back-Fire Antenna. Filed July 26, 1978.

Patent 3,775,570. Magneto-Optic Detection System With Noise Cancellation. Filed Feb. 25, 1972. Patented Nov. 27, 1973. Not available NTIS.

U.S. DEPARTMENT OF AGRICULTURE

Research Agreements and Patent Branch, General Services Division, Federal Building, Agricultural Research Service Hyatsville, Md. 20782

Patent 4,093,510. Xanthated Starch Amine Paper Additives. Filed Apr. 7, 1977. Patented June 6, 1978. Not available NTIS.

Patent 4,093,637. Alkyl 9,9(10,10)-Bis(Acyloxymethyl) Octadecanoates as Primary Plasticizers for Polyvinylchloride. Filed Jan. 31, 1977. Patented June 6, 1978. Not available NTIS.

U.S. DEPARTMENT OF TRANSPORTATION

Patent Counsel, 400 7th St. SW., Washington, D.C. 20590

Patent 3,224,713. Landing Gear System. Filed June 8, 1964. Patented Dec. 21, 1965. Not available NTIS.

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

National Institutes of Health, Chief, Patent Branch Westwood Building, Bethesda, Md. 20014

Patent application 886,106. 3-Deazaadenosine as an Inhibitor of Adenosylhomocysteine Hydrolase With Antiviral Activity. Filed Mar. 13, 1978.

Patent application 886,465. Portable Instrument for Measuring Neutron Energy Spectra and Neutron Dose in a Mixed N-Gamma Field. Filed Apr. 14, 1978.

Patent application 892,853. Capillary Cell Culture Device. Filed Apr. 3, 1978.

Patent application 895,082. Anti-Neoplastic Use of 1,4-Bis (Substituted Aminoalkyl Amino)-Anthraquinones. Filed Apr. 10, 1978.

Patent application 912,946. Method of Producing Delayed Release of Sodium Fluoride. Filed June 5, 1978.

Patent application 930,659. Optical Sensor of Plasma Constituents. Filed Aug. 2, 1978.

Patent 4,082,781. Synthesis of 2-Alkanoylamino-4-Nitrophenyl Phosphorylcholine-Hydroxide. Filed June 4, 1976. Patented Apr. 4, 1978. Not available NTIS.

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Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
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Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
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	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County Public Library	(513) 369-6969
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 242-7361 Ext. 258
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1226
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3128
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 18, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-19-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	12-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-1-78
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-29-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-19-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	5-16-77
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	6-17-77
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	11-22-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	5-1-78
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	2-17-77
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	1-17-77
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	10-3-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	1-16-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-11-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors: Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	10-6-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—G. M. FORLENZA, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	9-2-77

Expiration of patents: The patents within the range of numbers indicated below expire during November 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 3,007,169 to 3,001,168, inclusive
Plant Patents..... Numbers 2,101 to 2,107, inclusive

REISSUES

DECEMBER 26, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,869

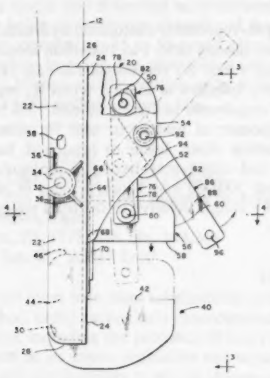
PINCER MECHANISM FOR PIPELINES

Edward Niederer, Jr., 19117 1st Northwest, Seattle, Wash. 98177, and James B. Ledford, 215 N. 56th Ave., Yakima, Wash. 98902

Original No. 3,905,219, dated Sep. 16, 1975, Ser. No. 511,190, Oct. 2, 1974. Application for reissue Sep. 15, 1977, Ser. No. 833,604

Int. Cl.[2] B21D *7/06*

U.S. Cl. 72—450 **17 Claims**



1. A pipe pincer mechanism for rapid attachment to and detachment from a back hoe boom, comprising:

a. an elongated support frame with upper and lower ends having means for detachably securing said supporting frame to said back hoe boom,

b. a pair of spaced apart mounting plates secured to said support frame,

c. an elongated upper blade arm pivotally mounted between said mounting plates outwardly of said supporting frame, said upper arm having an inner end and also an outer end for attachment to a power means for pivoting said upper arm about its mounting pivot for a predetermined distance,

d. an elongated lower blade arm having an upper end pivotally attached to the inner end of said upper arm also having a lower end,

e. a movable blade assembly including a generally vertically disposed blade attached to the lower end of said lower arm, and

f. a generally vertically disposed fixed blade located generally at the lower end of said supporting frame and between which fixed blade and movable blade pipe may be crimped when said upper arm is pivoted upwardly to force said movable blade assembly downwardly.

Re. 29,870

APPARATUS FOR INSTALLING AND REMOVING FLOW VALVES

Howard H. Moore, Jr., Weimar, Tex.; Harold E. McGowen, Jr., decesed, late of Houston, Tex., by Wanda E. L. McGowen, executrix, Longview, Tex., assignors to Sid W. Richardson Foundation and Perry R. Bass, Inc., both of Fort Worth, Tex.; a part interest to each

Original No. 3,827,490, dated Aug. 6, 1974, Ser. No. 95,408, Dec. 4, 1970. Continuation-in-part of Ser. No. 725,637, May 1, 1968, abandoned and a continuation-in-part of Ser No. 864,260 Sep. 18, 1969, abandoned. Application for reissue May 17, 1976, Ser. No. 687,158

Int. Cl.[2] E21B *23/00*

U.S. Cl. 166—117.5 **18 Claims**

15. A tubing mandrel for use in a well tubing comprising,

a mandrel body having connecting means at each end for connection in a well tubing and having an open bore for alignment with the well tubing,

a valve pocket positioned in the body offset from the open bore,

a guide sleeve positioned in the open bore adjacent the pocket, said sleeve mounted in said open bore with the upper end of said guide sleeve recessed in the wall of the open bore whereby interfering contact between the upper end of the sleeve and objects moving downward through the open bore is prevented; said sleeve including a longitudinally directed orientation slot in said sleeve and angularly spaced from the axis of the pocket a predetermined amount,

a guide surface positioned below such slot and directed upwardly toward the bottom of the slot for orientating a valve handling apparatus relative to the pocket, and

a downwardly directed actuating shoulder in the body above the pocket for actuating a valve handling apparatus.

Re. 29,871

FATTY COMPOSITIONS FOR USE IN COSMETIC MAKEUP COMPOSITIONS AND SAID COSMETIC MAKEUP COMPOSITIONS

Christos Papantoniou, Commune de Villevaude, and Jean Boulogne, L'Hay-les-Roses, both of France, assignors to L'Oreal, Paris, France

Original No. 3,937,811, dated Feb. 10, 1976, Ser. No. 477,515, Jun. 7, 1974. Application for reissue Mar. 11, 1977, Ser. No. 776,935

Claims priority, application Luxembourg, Jun. 8, 1973, 67772

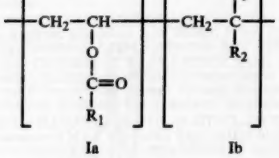
Int. Cl.[2] A61K 7/025

U.S. Cl. 424—64 15 Claims

1. A fatty composition for use in producing a cosmetic composition selected from the group consisting of a lip rouge and a mascara, comprising a mixture of:

i. at least one cosmetic fatty body consisting essentially of about 6–100% by weight of at least one cosmetic wax and 0–94% of at least one cosmetic oil, and

ii. a non-toxic, fat soluble copolymer having the formula:



Ia Ib

wherein

R_1 represents a saturated hydrocarbon chain, linear or branched, having from 1 to 19 carbon atoms,

R_2 represents a member selected from the group consisting of

a. $-O-\overset{\overset{O}{\|}}{C}-R_4$,

wherein R_4 has the same meaning as R_1 but is different from R_1 in the same copolymer,

b. $-CH_2-R_5$, wherein R_5 represents a saturated hydrocarbon chain, linear or branched, having from 5 to 25 carbon atoms,

c. $-O-R_6$, wherein R_6 represents a saturated hydrocarbon chain, having from 2 to 18 carbon atoms, and

d. $-CH_2-O-\overset{\overset{O}{\|}}{C}-R_7$,

wherein R_7 represents a saturated hydrocarbon chain, linear or branched, having from 1 to 19 carbon atoms, and R_3 represents hydrogen when R_2 represents radicals (a), (b) or (c) or R_3 represents *hydrogen or* methyl when R_2 represents radical (d), the said copolymer including at least 15% by weight of at least one monomer of unit Ia or unit Ib, wherein said saturated hydrocarbon chain, linear or branched, has at least 7 carbon atoms, said copolymer having a molecular weight between 2,000 and 500,000 and being present in an amount of about 2–35% by weight relative to the total weight of the fatty composition.

PLANT PATENTS

GRANTED DECEMBER 26, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,354
MINIATURE MOSS ROSE PLANT

Julia K. Sudol, Alhambra, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 27, 1977, Ser. No. 864,933
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—8 **1 Claim**

1. The hybrid miniature moss rose plant substantially as herein shown and described and having a growth habit appropriate to miniature roses, there being on its peduncles, buds, sepals and hips many single and branched moss-scented stipitate glands, the buds being ovoid to urn-shaped and the flowers, which are double, comprising 35 to 50 petals plus 2 to 10 petaloids, being off-white in color, the plant being characterized further in that it blooms nearly continuously during the growing season, has viable pollen and sets hips.

4,355
MINIATURE MOSS ROSE PLANT

Jack E. Christensen, San Dimas, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 27, 1977, Ser. No. 864,244
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—9 **1 Claim**

1. A hybrid miniature moss rose plant substantially as herein illustrated and described, being particularly characterized by a combination of features, including the presence of many moss-scented stipitate glands on its stems, peduncles and sepals, the vigor of its growth habit and its ability to bloom almost continuously throughout the growing season, the very double petalage of its blooms, comprised of from 25 to 60 petals, plus 1 to 8 petaloids, and the generally pink coloration of its blooms.

4,356
MINIATURE MOSS ROSE PLANT

Jack E. Christensen, San Dimas, Calif., assignor to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Dec. 27, 1977, Ser. No. 864,245
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—10 **1 Claim**

1. A new variety of bush rose of the hybrid miniature moss class, substantially as illustrated and described herein, being particularly characterized by a combination of features including the bearing of many moss-scented stipitate glands on its peduncles, buds, sepals and hips; by the coloration of its flowers, which are of a deep velvety red color, and open relatively slowly with a high pointed center; the petalage of its blooms, which have from about 40 to about 50 petals plus about 7 to 20 petaloids; and the tendency to bloom throughout the growing season.

4,357
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia St., Ontario, Calif. 91761

Filed Sep. 29, 1977, Ser. No. 837,746
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the distinct and unusual color of its blooms primarily a medium pink orange, 36-3 blending with 36-2 and ending with a pale pink 36-1 when full blown, the long lastingness of the bloom color on the plant, heavily petaled, open flower form, distinct rose perfume, good tea habit with strong straight stems, the blooms being produced in abundance for cutting.

4,358
CHRYSANTHEMUM PLANT

Jack M. Meek, Barberton, and William E. Duffett, Akron, both of Ohio, assignors to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 25, 1977, Ser. No. 781,413
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of *Chrysanthemum morifolium;* Ramat, known by the cultivar name Coralama and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form, daisy capitulum type, greyed-red ray floret color, uniform nine week flowering response to photoperiodic shortday control, medium plant height, diameter across face of capitulum from 60 to 80 mm. at maturity, and semi-upright branching pattern.

4,359
APPLE TREE (COOP 12)

Edwin B. Williams, Lafayette; Jules Janick; Frank H. Emerson, both of West Lafayette, all of Ind.; Daniel F. Dayton, Urbana, Ill.; L. Fredric Hough, Bloomsbury, and Catherine Bailey, Englishtown, both of N.J., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Aug. 4, 1977, Ser. No. 821,643
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—34 **1 Claim**

1. A new and distinct apple tree substantially as shown and described particularly characterized by resistance to apple scab, good fresh fruit quality, smooth waxy skin, ability to maintain quality in storage, and maturity approximately eight (8) weeks before 'Delicious' and four and one-half (4½) weeks before 'Prima'.

PATENTS

GRANTED DEC. 26, 1978

ERRATA

For CLASS	See PATENT NO.
405–024	4,130,994
405–224	4,130,995
241–049	4,131,247
296–095 Q	4,131,269
242–074	4,131,305
301–006 A	4,131,321
301–037 PB	4,131,322
301–036 R	4,131,323
357–013	4,131,339
264–138	4,131,415
299–002	4,131,416
141–001	4,131,426
422–045	4,131,431
422–177	4,131,432
521–091	4,131,481
264–040.5	4,131,596
528–053	4,131,600
528–279	4,131,601
528–049	4,131,602
528–045	4,131,603
528–079	4,131,604
528–077	4,131,605
528–058	4,131,606
562–469	4,131,618
264–333	4,131,638
423–020	4,131,639
423–022	4,131,640
423–034	4,131,641
423–193	4,131,642
423–239	4,131,643
423–447.5	4,131,644
423–501	4,131,645
423–591	4,131,646
424–010	4,131,647
424–022	4,131,648
424–180	4,131,649
424–028	4,131,650
424–078	4,131,651
424–241	4,131,652
528–335	4,131,712

PATENTS

GRANTED DECEMBER 26, 1978

GENERAL AND MECHANICAL

4,130,902

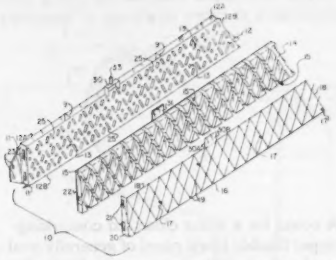
COOLING HATBAND

Joseph R. Mackenroth, III, 8117 McArthur Dr., Harahan, La. 70123, and Hugo B. Bode, 9555 King Crest Pkwy., Baton Rouge, La. 70810

Continuation-in-part of Ser. No. 701,858, Jul. 1, 1976, abandoned. This application Aug. 1, 1977, Ser. No. 820,755

Int. Cl.[2] A42B *1/18*

U.S. Cl. 2—7 **16 Claims**



11. Headwear with built-in cooling means comprising:

a. headwear means for covering the wearer's head, said headwear means being provided with a liquid dispensing reservoir therein;

b. liquid diffusing headband means within said headwear means for holding said headwear means on the wearer's head and for diffusing water received by said headband means from said reservoir to substantially all parts of said headband means, said headband means extending about the length of at least one half of the inner periphery of said hedwear means and being in substantially continuous contact with the head of the wearer;

c. duct means connecting said reservoir and said headband means for conveying liquid contained within said reservoir to said headband means; and

d. air contact means on said headband means comprising a plurality of regularly spaced matrix openings extending about the length of at least one half of the inner periphery of said headband means for allowing air to contact the liquid contained within said headband means there being provided a corresponding second cooperative matrix of openings in a supportive hatband means which second cooperative matrix of openings register with said openings in said headband means when said supportive hatband means and said headband means are assembled in a face-to-face arrangement.

4,130,903

PROTECTIVE DEVICE PARTICULARLY FOR WELDING AND CUTTING WORK

Henrikus J. van den Berg, and Gerardus C. A. M. Hurkmans, both c/o Techn. Bureau A.B.O.F. 1972 B.V., Joubertstr. 10-12, both of Nijmegen, Netherlands

Filed Nov. 10, 1976, Ser. No. 740,676

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1975, 2550559

Int. Cl.[2] A61F *9/06*

U.S. Cl. 2—8 **16 Claims**

1. Automatic protective equipment for performing work in areas of greatly varying light intensities, said equipment comprising:

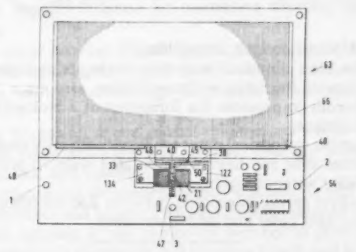
wall means;

a transparent window mounted at a fixed position within said wall means;

first planar filter means mounted so as to cover at least a portion of said transparent window, having uniform grid strips thereon reaching from one side of said first filter means to the opposite side, said grid strips being highly absorbent of all electromagnetic radiation incident thereon of selected frequencies, and said first filter means having elongated areas between said grid strips highly transparent to all incident visible light, said grid strips and said highly transparent areas respectively lying parallel and being of uniform width;

second planar filter means adjacent to said first filter means, covering said first filter means, and mounted for movement relative to said first filter means through a predetermined limited distance, said second filter means having uniform grid strips thereon parallel to the grid strips on said first filter means, said second filter means grid strips reaching from one side of said second filter means to the opposite side, said grid strips being highly absorbent of all electromagnetic radiation incident thereon of selected frequencies, said second filter means having elongated areas between said grid strips highly transparent to all orientations of incident visible light, the width of said second filter means grid strips being at least as great as the width of said first filter means transparent areas;

electrically energizable means attached to said wall means, having a first magnetic coil, a second magnetic coil, and an armature connected to said second filter means and magnetically flux-linked with said first and second magnetic coils for moving said second filer means in a first



direction through said limited distance relative to said first filter means when said first magnetic coil is energized and for moving said second filter means in a second direction opposite said first direction through said limited distance when said second magnetic coil is energized;

spring means for urging said second filter means through said limited distance in said second direction when said first magnetic coil is de-energized and said second magnetic coil is energized, so that when said second filter means has moved said limited distance in said first direction when said first magnetic coil is energized, said grid strips and said highly transparent areas of said second filter means cover respectively said grid strips and said highly transparent areas of said first filter means, thereby forming a relatively highly transparent window area, and when said second filter means moves said limited distance in said second direction when said second magnetic coil is energized, said grid strips of said second filter means covver said highly transparent areas of said first filter means, thereby forming a highly absorbent covering for said transparent window; and

controlling means for energizing said energizable means in response to incident radiation comprising:

photoelectric means responsive to incident radiation, and

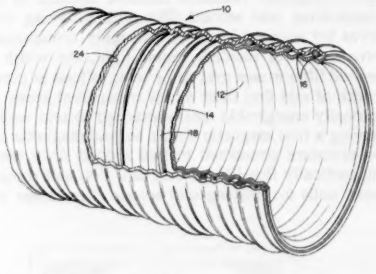
amplifier means, having an output connected to said energizable means and an input connected to said photoelectric means for energizing said first magnetic coil when high

intensity electromagnetic radiation is incident on said photoelectric means and for energizing said second magnetic coil when low intensity electromagnetic radiation is incident on said photoelectric means, so that as said radiation changes between high and low intensity levels, said second filter means shifts in said first and second direction respectively through said limited distance, thereby prohibiting high intensity light from damaging the eyes of a user of said equipment by first heavily filtering said high intensity light with said highly absorbent grid strips on said first and second filter means.

4,130,904
PROSTHETIC BLOOD CONDUIT

Robert L. Whalen, Cambridge, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jun. 6, 1977, Ser. No. 803,904
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.4 **7 Claims**

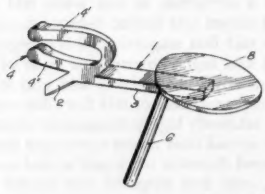


1. A blood conduit, comprising:
a flexible cylindrical inner tube having convoluted walls to provide flexibility without kinking, said inner tube being porous to promote the formation of a biologically stable interface;
a flexible cylindrical outer tube concentrically enclosing said inner tube and having convoluted walls to provide flexibility without kinking; and
a helical spring interposed between and frictionally engaging said outer and said inner tubes.

4,130,905
ARTIFICIAL MALLEUS COLUMELLA FOR THE HUMAN EAR

Eduardo C. C. Mercandino, Montevideo 606, Buenos Aires, Argentina

Filed Jun. 3, 1977, Ser. No. 803,335
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.9 **4 Claims**

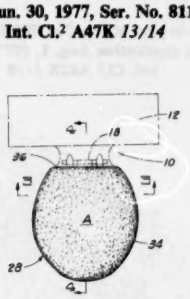


1. An artificial malleus columella for the human ear comprising an elongated member angled downwardly at a point along its length to provide first and second linear portions, said angle being an obtuse angle, a stem depending from the underside of the first linear portion to contact the stapes of the middle ear when the artificial malleus columella is in position and a clamp adapted to engage the bridge of the ear and being located on the external surface of the obtuse angle and extending over the second linear portion whereby the artificial malleus columella will be held in position below the level of said bridge.

4,130,906
WATER CLOSET LID COVER

Carl L. Robertson, 3104 Carlton Way, Oklahoma City, Okla. 73120

Filed Jun. 30, 1977, Ser. No. 811,555
Int. Cl.[2] A47K *13/14*
U.S. Cl. 4—242 **6 Claims**



1. A cover for a water closet lid comprising:
an upper flexible fabric panel of generally oval configuration and having an outer arcuate peripheral edge and a straight back edge;
a lower flexible fabric panel of generally oval configuration and complimentary in configuration to the upper panel, said upper and lower flexible panels each having a widest portion as measured along a line extending parallel to said straight back edge thereof;
a first elastomeric band at the aligned ends of one of the ends of the straight back edges of said upper and lower panels joining a first portion of said outer arcuate peripheral edges of the upper and lower panels to each other;
a second elastomeric band at the aligned ends of the second of the ends of the straight back edges of said upper and lower panels joining a second portion of said outer arcuate peripheral edges of the upper and lower panels to each other, said first and second elastomeric bands each being elastically stretchable in a direction substantially normal to the straight edges of said upper and lower panels, and also in a direction substantially parallel to said straight back edges, and said first and second elastomeric bands each extending from the respective ends of said straight back edges to said widest portion of said upper and lower panels as measured along said line substantially parallel to said back edges; and
means joining the remaining portions of the outer arcuate peripheral edges of the upper and lower panel to each other where said panels are not joined by said first and second elastomeric bands to form a closed cover open only at the space between the straight back edges thereof.

4,130,907
SQUAT-TYPE WATER CLOSET

George J. Flegel, Michigan City; Roger L. Mielbeck, Laporte, and Patrick J. Pizarek, Michigan City, all of Ind., assignors to Josam Manufacturing Co., Michigan City, Ind.

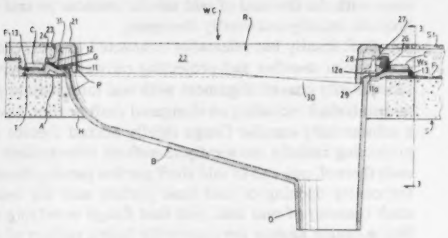
Filed Aug. 23, 1977, Ser. No. 827,065
Int. Cl.[2] E03D *1/00, 3/00, 5/00*
U.S. Cl. 4—300 **12 Claims**

1. A squat-type water closet for installation in and substantially level with a floor and providing at the floor surface an elongated opening, comprising: a bowl member having
a waste outlet or discharge opening from the bowl bottom and having a discharge connection formation for connecting to a soil line,
a bottom sloping downwardly inwardly and from front to back to the outlet,

outwardly extending horizontal flange means for bowl-supportive engagement with environmental structure, and

an integral flange having on its top region an upraised peripherally continuous seat formation, a flushing rim member having its outer periphery complementarily shaped and sloped to be matingly received within said seat formation continuous with a seal interposed between said rim member and seat formation to define the effective top opening of the water closet, and

said flushing rim member being downwardly open and cooperating with the bowl member top region to form a flush water passageway and defining with the top margin of the bowl opening a slot substantially continuous about the bowl top periphery to discharge water in a substantially



peripherally continuous sheet down the bowl inside surface for flushing the bowl interior, a flushing water supply connection integrally formed on one of said members providing an inlet to said flush water distribution passageway, said flushing water supply connection communicating with said flush water passage through an inlet-restricting orifice at one end of the closet whereby to increase the velocity of said flush water in said passage, one of said members supporting a V-shaped divider baffle with vertical apical edge aligned with the orifice axis for dividing incoming flushing water to flow bilaterally down the passageway along each side of the water closet, and

means for securing said flushing rim member sealed to the seat formation on the bowl.

4,130,908

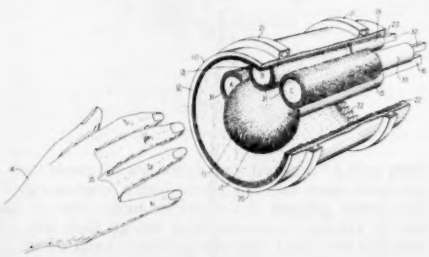
HANDSCRUBBING DEVICE

John H. Alcamo, 5 Canfield St., Budd Lake, N.J. 07828

Filed Feb. 2, 1978, Ser. No. 874,659

Int. Cl.[2] A47K *7/04*

U.S. Cl. 15—21 R **7 Claims**



1. In apparatus for mechanically scrubbing the hand and fingers of a user, the combination comprising:

first brush means for engaging inserted palm and selected finger portions of a user's hand and scrubbing the surfaces thereof when rotated;

second brush means for engaging the inserted back and selected finger portions of a user's hand and scrubbing the surfaces thereof when rotated, said second brush means being annularly disposed with respect to said first brush means;

third brush means for internally accommodating selected inserted fingers of a user, externally engaging selected inserted palm and finger portions of a user and scrubbing said inserted fingers and palm and finger portions when rotated, said third brush means being disposed between said first and second brush means; and

means for rotating said first, second and third brush means so as to simultaneously scrub all of the exterior surfaces of a user's inserted hand and fingers.

4,130,909

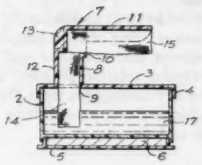
MIRROR CLEANING DEVICE

Shelly M. Greene, 1831 Watson Rd., Abington, Pa. 19001

Filed Sep. 22, 1977, Ser. No. 835,654

Int. Cl.[2] B05C *11/105;* **B08B** *3/04*

U.S. Cl. 15—104.92 **9 Claims**



1. A mirror cleaning device, comprising:

(a) a cup member adapted for containing cleaning liquid therein;

(b) a cup cover member insertable over said cup member in releasable securement thereto and having at least a first opening formed therethrough for passage of said cleaning liquid;

(c) liquid dispensing means partially immersed within said cleaning liquid and extending external said cup member through said first opening;

(d) liquid dispensing securement means mounted on said cup cover member and having a through passage aligned with said first opening in said cup cover member to provide a continuous flow passage of said cleaning liquid, said liquid dispensing securement means including a first vertically directed tubular member extending from said cup cover member and a second horizontally directed tubular member secured to said first tubular member, said second tubular member having an open contour outer wall throughout only a portion of said horizontally extended length for providing an enlarged mirror contact surface with said liquid dispensing means; and

said liquid dispensing means including a first liquid absorbent member insertable within the vertically directed portion of said through passage of said liquid dispensing securement means and extending into said cleaning liquid, and a second liquid absorbent member insertable within a second horizontally directed portion of said through passage of said liquid dispensing securement means, said second liquid absorbent member contacting said first liquid absorbent member to provide a continuous path for said cleaning liquid flow.

4,130,910

WRINGER TYPE MOP

Neil A. Raven, 1279 South, Rd., St. Marys, Australia

Filed Aug. 18, 1977, Ser. No. 825,559

Claims priority, application Australia, Feb. 15, 1977, 9082/77

Int. Cl.[2] A47L *13/142*

U.S. Cl. 15—120 A **7 Claims**

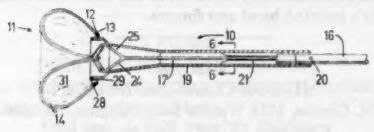
1. A mop having a fibrous yarn head,

a first yarn engaging means engaging the yarn and forming it into a head having a plurality of loop strands,

a second yarn engaging means secured to the loop strands intermediate their ends,

a handle secured to one of said yarn engaging means,

a grip sleeve secured to the other of said yarn engaging means, said grip sleeve receiving said handle and movable with respect thereto between an operative position wherein said yarn engaging means are relatively close to



one another and a wringing position wherein said yarn engaging means are spaced relatively more distant from each other, and

key and open ended keyway means on the handle and sleeve, the keyway means being of such length that it is engaged by the key between said operative and wringing positions to thereby prevent relative rotation of the handle and sleeve, but the key disengages from the keyway means at both said positions thereby permitting said relative rotation of handle and sleeve.

4,130,911

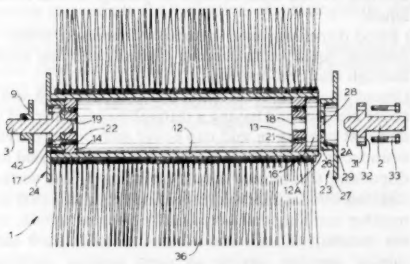
STREET BRUSH

Gaylord J. Clark, 4769 Paw Paw Lake Rd., Coloma, Mich. 49038

Filed May 20, 1977, Ser. No. 798,998

Int. Cl.[2] A46B *13/02*

U.S. Cl. 15—179 **2 Claims**



1. Mounting means for a cylindrical rotatable brush, such as used in street sweeping or car washing machines, comprising in combination:

an elongated, cylindrical, tubular member for carrying brush bristles and having a central opening extending throughout the length thereof;

a pair of disks positioned within the central opening of said tubular member and rigidly fixed thereto, said disks being positioned adjacent the opposite ends of said tubular member and spaced inwardly a selected distance from the adjacent ends to define a recess at each end of said tubular member which opens axially outwardly thereof, each said disk constituting the bottom wall of one of said recesses;

each said disk having a central shaft opening formed therein and coaxially aligned with the longitudinal axis of said tubular member, each said disk also having a plurality of threaded openings therein, said threaded openings being radially spaced outwardly from said central shaft opening and arranged therearound;

an end plate at each end of said tubular member, each said end plate being hat-shaped and including a cup-shaped crown fitted within a respective one of said recesses, said hat-shaped end plate also including an annular rim which is fixed to the edge of said crown and projects radially outwardly therefrom;

said cup-shaped crown having a base portion which overlies and substantially bears against the respective disk, said base portion having a center opening extending therethrough and generally coincident with the central shaft opening of the respective disk, said base portion also having bolt holes extending therethrough and generally coincident with the threaded openings of the respective disk;

said rim comprising a substantially flat annular plate which projects radially outwardly substantially beyond the outer periphery of said tubular member, said rim being positioned closely adjacent and substantially in snug engagement with the free end of said tubular member as said rim projects radially outwardly therepast;

a stub shaft fixedly but releasably connected to each end of said tubular member and projecting outwardly thereof in substantially coaxial alignment with said longitudinal axis, said stub shaft including an elongated shaft portion having a substantially annular flange rigidly affixed thereto and projecting radially outwardly therefrom intermediate the ends thereof, one end of said shaft portion passing through the center opening of said base portion and the central shaft opening of said disk, and said flange overlying and fitting snugly against the outwardly facing surface of said base portion, said flange also having bolt openings extending therethrough and generally coincident with the bolt openings in said base portion; and

a plurality of screws passing through the aligned bolt openings of said flange and said base portion and said disk for fixedly joining said stub shaft, said end plate and said disk together;

whereby each said stub shaft is rigidly held with respect to said tubular member and projects axially outwardly therefrom, said stub shaft being readily disassembled from tubular member by removal of said screws.

4,130,912

TAPE HEAD CLEANING DEVICE

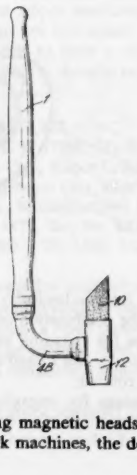
Stewart A. Sheppard, Hailsham; Philip B. Arbib, Chalfont St. Peter, and Maurice R. Pert, Great Billington near Leighton Buzzard, all of England, assignors to Bib Hi-Fi Accessories Limited, Hertfordshire, England

Filed Nov. 2, 1976, Ser. No. 738,096

Claims priority, application United Kingdom, Nov. 27, 1975, 48897/75

Int. Cl.[2] B25G *1/04*; G11B *5/41*

U.S. Cl. 15—210 R **3 Claims**



1. A device for cleaning magnetic heads of magnetic tape recording and/or playback machines, the device comprising

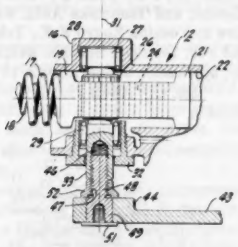
an elongate holder, and
a holding member which is constructed to receive and hold a replaceable tape head cleaner,
the holder comprising
a straight first elongate member, and
a second elongate member connected releasably end-to-end with the first elongate member and having its two ends inclined to each other,
a spigot of non-circular cross-section on the free end of the second elongate member, and
a plurality of corresponding sockets in the holding member, the spigot and the sockets being shaped to allow the spigot to be located non-rotatably as a push fit in any one of the sockets in any one of a plurality of orientations of the holding member relative to the second elongate member.

4,130,913

DOOR CLOSER

William G. Rodseth, Princeton, Ill., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Aug. 18, 1977, Ser. No. 825,591
Int. Cl.² E05F 3/00
U.S. Cl. 16—49 **16 Claims**



1. A door closer for use with a door frame and a door panel comprising a housing, a shaft having a thread, means mounting said shaft to rotate about an axis in said housing, means constraining said shaft against axial movement relative to said housing, means interconnecting said door frame and said door panel through said housing and said shaft, said interconnecting means including a member engaging said thread and movable axially of said shaft, and means on said shaft and on said member for limiting axial movement of said member and said shaft.

4,130,914

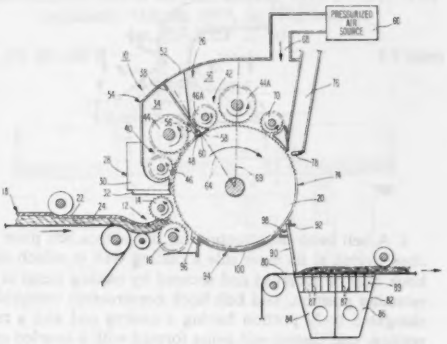
Patent Not Issued For This Number

4,130,915

CARDING OPERATION FOR FORMING A FIBROUS STRUCTURE

Joel P. Gotchel, Glen Mills, Pa., and Henry J. Norton, Wilmington, Del., assignors to Scott Paper Company, Philadelphia, Pa.

Filed Sep. 19, 1977, Ser. No. 834,709
Int. Cl.² D04H 1/00
U.S. Cl. 19—304 **13 Claims**

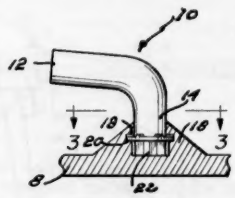


1. A carding method for forming a nonwoven fibrous structure including short fibers under ¼ inch in length and longer reinforcing fibers blended together, said short fibers being the predominate fiber component, by weight, in the structure; the method including the steps of:
rotating a main carding drum having projections on its outer periphery at a surface speed of at least about 12,500 feet/minute;
directing a fibrous feed into engagement with the rotating outer periphery of the main drum whereby rotation of the drum past the fibrous feed separates fibers from said feed, said fibrous feed including short fibers under ¼ inch in length and longer reinforcing fibers, said short fibers constituting the predominate fiber component, by weight, in said feed;
directing fibers separated from the fibrous feed into a working section including rotating satellite rolls positioned adjacent the main drum and having projections on their outer peripheries for cooperating with projections on the periphery of the main drum to individualize and blend together the fibers that are directed into the working section;
providing a housing over the working section that substantially isolates the working section from the environment around it so that pressure conditions within the working section can be independently controlled;
providing a source of pressurized air;
communicating said source of pressurized air with the interior of the housing for continuously maintaining a positive pressure in the working section at a level in excess of 2 inches of water to minimize undesirable air flow characteristics that adversely affect the individualizing and blending of the fibers in the working section;
conveying the individualized fibers through the pressurized working section to a release zone on the periphery of the main drum at which the individualized and blended fibers are released from the periphery of said main drum for subsequent conveyance to a foraminous forming surface upon which the fibrous structure is formed.

4,130,916
BELT HOOK AND METHOD OF MAKING SAME

Terence P. King, 76 S. Main St., Middleboro, Mass. 02346

Filed Aug. 29, 1977, Ser. No. 828,474
Int. Cl.[2] A44B *11/22*
U.S. Cl. 24—186 3 Claims

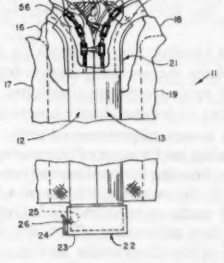


1. A belt hook construction for use with a belt plate of the class having at its inner side a casting well in which the belt hook may be received and secured by casting metal in a belt retaining position, said belt hook construction comprising an elongated body portion having a casting end and a retainer portion, said casting end being formed with a knurled extremity and an annular flange abutting the knurled extremity and projecting outwardly therefrom, an opposite side of the annular flange being formed with spaced apart radially disposed ridges.

4,130,917
FLEXIBLE SLIDE FASTENER

Predrag Shopalovich, Ashland, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 16, 1978, Ser. No. 869,548
Int. Cl.[2] A44B *19/32, 19/02*
U.S. Cl. 24—205.1 R 4 Claims

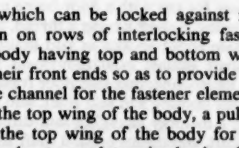


1. A slide fastener comprising:
a first elongated guide member having a longitudinally extending closure edge formed of a resilient material and an opposite edge for attachment to an edge of a first flexible sheet;
a second elongated guide member having a longitudinally extending mating edge formed of a resilient material adapted for engagement with said closure edge and an opposite edge for attachment to an edge of a second flexible sheet to be attached to the first flexible sheet;
a slide member adapted to simultaneously engage and slide longitudinally along said first and second guide members and to force adjacent portions of said closure and mating edges into engagement in response thereto, said closure and mating edges comprising mutually engaging profiled surfaces adapted to provide a liquid seal between said first and second guide members;
a plurality of female coupling elements distributed along said closure edge; and
a plurality of male coupling elements distributed along said mating edge and adapted to enter and latch with said female coupling elements in response to engagement of said closure and mating edges;
said male coupling elements comprising resilient latching portions that are compressed by said female coupling elements during entry thereinto and expanded into latching engagement therewith in response to complete entry thereinto, said latching portions comprising spring members having spaced apart resilient legs adapted to be forced together in response to entry into said female coupling elements, said female coupling elements defining openings with smaller dimensions than the spacing between said resilient legs, said openings being defined by cavities formed in said closure edge;
said mating edge defining a plurality of longitudinally distributed cavities and said male coupling elements comprising base portions including securing means for releasably securing said base portions within said cavities in said mating edge, whereby said male coupling elements are easily replaced.

4,130,918
LOCK SLIDER FOR SLIDE FASTENERS

Susumu Ishii, Kurobe, and Tsunetaka Aoki, Kamiichi, both of Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 24, 1978, Ser. No. 881,114
Claims priority, application Japan, Mar. 3, 1977, 52-25439[U]
Int. Cl.[2] A44B *19/30*
U.S. Cl. 24—205.14 A 5 Claims



1. A slider which can be locked against movement in a desired position on rows of interlocking fastener elements, comprising a body having top and bottom wings which are connected at their front ends so as to provide therebetween a Y-shaped guide channel for the fastener elements, there being an aperture in the top wing of the body, a pull tab connected at one end to the top wing of the body for pivotal motion relative to same about a predetermined axis, a locking pawl on said one end of the pull tab intruding into the guide channel in the body through the aperture in its top wing, the locking pawl having a predetermined point of contact with the fastener elements for pressing same against the bottom wing of the body when the pull tab is in a recumbent position on the body, the predetermined contact point of the locking pawl being

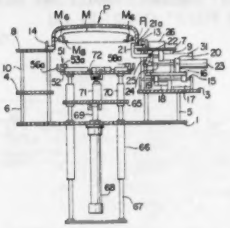
disposed forwardly of the predetermined axis of the pivotal motion of the pull tab when the latter is in the recumbent position, and an abutment formed on the inside surface of the top wing of the body and disposed forwardly of the aperture therein so as to be abutted upon by a tip of the locking pawl when the pull tab is in the recumbent position, the predetermined contact point of the locking pawl being disposed rearwardly of its tip when the pull tab is in the recumbent position.

4,130,919

APPARATUS FOR REMOVING A SHADOW MASK ASSEMBLY FROM A PANEL AND INSERTING SAME INTO A DUMMY PANEL

Tadao Oyama, Mobara, Japan, assignor to Hitachi, Ltd., Japan

Filed Jul. 27, 1977, Ser. No. 819,619
Claims priority, application Japan, Aug. 11, 1976, 51-94898
Int. Cl.[2] H01J *9/00*
U.S. Cl. 29—25.19 **6 Claims**



1. Apparatus for removing from a panel a shadow mask assembly supported within said panel and for inserting said shadow mask assembly into a dummy panel, said shadow mask assembly having secured to its outer lateral surfaces resilient plates each having a free end and formed in the vicinity of the free end with a hole, and said panel and said dummy panel each having secured to its inner lateral surfaces pins projecting inwardly for engagement in the respective holes formed in the shadow mask assembly, such apparatus comprising, in combination:

means for supporting said panel at a lower end thereof with the panel opening facing downwardly in a manner to permit the panel to move substantially horizontally, said means including a space large enough to permit the shadow mask assembly to move downwardly therethrough after the shadow mask assembly is removed from the panel;

means operative to come into engagement with inner and outer surfaces of side walls of the panel to position the panel in a shadow mask assembly removing position and hold same in said position on said support means;

shadow mask assembly removing means operative to remove the shadow mask assembly from the panel including a mask support plate, means mounted on said mask supported plate for bending the resilient plates of the shadow mask assembly in a manner to release said plates from engagement with the pins of the panel, and a first driving means for moving said mask support plate in reciprocatory movement between a first position in which the shadow mask assembly is in the panel and is engaged by said removing means and a second position located beneath said first position wherein said mask assembly is removed from said panel;

means for positioning said dummy panel on said means for supporting said panel;

four support members mounted on said mask support plate and each having a support surface for supporting the underside of one of four corners of the shadow mask assembly and a guide surface for guiding an outer lateral surface of one of the four corners of the shadow mask assembly in such a manner that the shadow mask assembly is positioned on said mask support plate; and

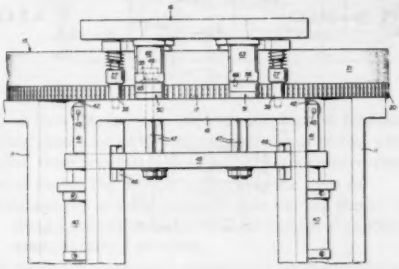
driving means for moving said mask support plate to a position in which the shadow mask assembly supported by said four support members is positioned within said dummy panel.

4,130,920

MACHINE TOOL

Andrew V. Siarto, West Bloomfield, Mich., assignor to Siorto Machine & Tool Co., Inc., West Bloomfield, Mich.

Continuation-in-part of Ser. No. 801,181, May 27, 1977. This application Oct. 20, 1977, Ser. No. 843,769
Int. Cl.[2] B23P *23/00*
U.S. Cl. 29—38 R **8 Claims**



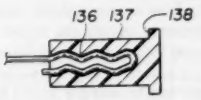
1. In a rotary transfer machine tool having a gear supported for rotation over a fixed, angular, composite support table, a plurality of peripherally spaced pallets superimposed on said gear for rotation therewith, a plurality of work stations spaced at the pallet intervals, and drive means for rotatably driving the gear in step-wise fashion to roughly align each pallet with one of said work stations, the improvements of a plurality of peripherally spaced rotatable support elements underlying said gear, power means for raising and lowering said support elements to correspondingly raise and lower said gear relative to said table, and mating locating elements on said table and said pallets for interfitting snug engagement when said gear is lowered to accurately position each pallet.

4,130,921

METHOD OF MAKING ORTHODONTIC APPLIANCE HAVING REPLACEABLE TOOTH ENGAGING MEANS

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Division of Ser. No. 816,138, Jul. 15, 1977, Pat. No. 4,091,540, which is a continuation-in-part of Ser. No. 708,305, Jul. 26, 1976, Pat. No. 4,054,996. This application Nov. 16, 1977, Ser. No. 852,148
Int. Cl.[2] B21F *43/00*; B23P *13/00*
U.S. Cl. 29—160.6 **4 Claims**



1. A method of making an orthodontic appliance comprising:

forming an elongated member with a main portion and a bent back portion thereon, said main and bent back portions being spaced from each other;

forming undulations on a surface of at least one of said main and bent back portions;

filling said space between said main and bent back portions with a filler material which is later removable;

molding a member around said main and bent back portions with said filler material therebetween so that said molded member may have an inner surface substantially conforming to the outer surface configuration of said main and bent back portions; and then

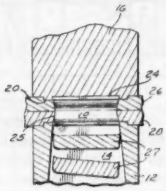
removing said filler material from the space between said main and bent back portions to permit said main and bent back portions to be resiliently deformed toward each other.

4,130,922

HEADLESS RIVETING SYSTEM

Albert C. Koett, Norwood, Ohio, assignor to AKH Inc., Twin Lakes, Wis.

Filed Nov. 7, 1977, Ser. No. 849,164
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—243.53 **5 Claims**



1. A headless riveting system of the class described comprising:

(a) a rivet of a length substantially equal to the sum of the thicknesses of the materials to be fastened together and having flat ends of substantially the same size and shape,

(b) a flat die having opening therethrough of the same size and shape as the rivet end and a ridge surrounding said opening at the edge thereof, and

(c) a punch having a flat end-area of substantially the same size and shape as the end of the rivet and ridge-like staking means projecting from the edge of said flat end-area at opposite sides thereof,

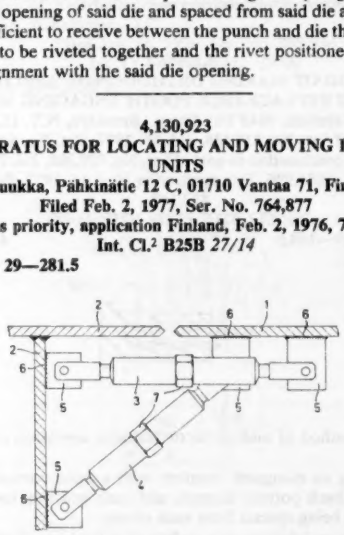
(d) the flat end-area of the punch being axially aligned with the opening of said die and spaced from said die a distance sufficient to receive between the punch and die the materials to be riveted together and the rivet positioned in axial alignment with the said die opening.

4,130,923

APPARATUS FOR LOCATING AND MOVING HEAVY UNITS

Esko Muukka, Pähkinätie 12 C, 01710 Vantaa 71, Finland

Filed Feb. 2, 1977, Ser. No. 764,877
Claims priority, application Finland, Feb. 2, 1976, 760247
Int. Cl.[2] B25B *27/14*
U.S. Cl. 29—281.5 **5 Claims**



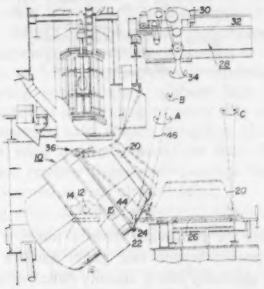
1. Apparatus for positioning and moving heavy units comprising a socket member, a pair of spindles partly enclosed by and threadably engaged in opposite ends of the socket member, means cooperating with said spindles for synchronizing the rotation of the spindles with respect to each other, means on each of the spindles for connecting the spindles to the units to be positioned and a pair of axially spaced slide means arranged on each of said spindles for supporting transverse bending loads applied to the apparatus and an external thread on each spindle arranged between the pair of axially spaced slide means associated therewith.

4,130,924

REMOVAL AND/OR INSTALLATION OF TOP SECTION OF STEELMAKING VESSEL

Kenneth D. Madill, Sault Ste. Marie, Canada, assignor to The Algoma Steel Corporation, Limited, Ontario, Canada

Filed Sep. 30, 1977, Ser. No. 838,222
Claims priority, application Canada, Jun. 27, 1977, 281398
Int. Cl.[2] B23P *7/00*
U.S. Cl. 29—401 F **3 Claims**



1. A method of removing and installing a top section of a steelmaking vessel, the vessel including a lower body section with said top section being detachably secured thereto, there being an operating platform including a vessel charging side alongside of said vessel, said vessel top section further being provided with lift bracket means on that side of the vessel nearest the charging side of the operating platform in the upright position of the vessel, and said body section being mounted for rotation about a horizontal axis, the method including

(a) providing a hinge connection between the top section and the body section of the vessel such that the hinge axis thus defined is parallel to the rotation axis of the vessel, said hinge being located to that side of the vessel which is remote from the charging side of the operating platform in the upright position of the vessel;

removing the vessel top section by:

(b) rotating the body section about the rotation axis from an upright position toward the charging side of the operating platform while simultaneously applying lifting forces to said vessel top section via the lift bracket means to support the same whereby the top section pivots relative to said body section about the hinge axis, and continuing the rotation of the body section while supporting the top section and controlling the orientation thereof so that the top section is carried out over the operating platform and progressively lowered onto same;

(c) separating the top section from the body section at the hinge connection and subsequently effecting repair or replacement of the top section;

and subsequently installing the repaired or a replacement vessel top section by:

(d) locating the top section on the operating platform;

(e) connecting the top section to the body section via the hinge connection, and

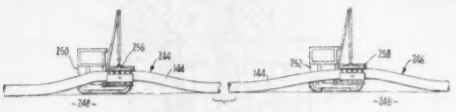
(f) rotating the body section from an inclined position toward an upright position while simultaneously applying lifting forces to the top section via the bracket means to support the top section and to control the orientation thereof such that the top section is carried away from the operating platform and gradually is pivoted relative to the body section about the hinge axis back into close juxtaposition with the body section.

4,130,925

METHODS OF PIPELINE CONSTRUCTION IN ARCTIC AND SUBARCTIC REGIONS

Murray Gibson, 111 Silver Valley Pl., NW., Calgary, Alberta, Canada (T3B 4B5)

Filed Apr. 21, 1977, Ser. No. 789,744
Int. Cl.[2] B23Q *17/00*
U.S. Cl. 29—407 22 Claims



1. The method of pipeline construction in arctic and subarctic regions, comprising:

welding joints of pipe together to provide a plurality of unitary pipe sections;

consecutively moving each said pipe section a substantial part of the distance from its place of fabrication to its place of installation over an elongated snow pad with plural parts of said pipe section bearing upon said elongated snow pad; and

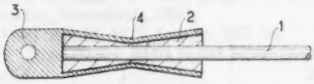
attaching, as by welding, each said pipe section to an adjacent of said sections to form said pipeline.

4,130,926

METHOD OF PRODUCING A ROD ANCHORING STRUCTURE

Michel Willem, Vichy, France, assignor to Ceraver S.A., Paris, France

Filed Feb. 17, 1977, Ser. No. 769,807
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—421 M 18 Claims



1. A method of producing a rod anchoring structure comprising the steps:

molding onto the end of a rod a surrounding, double-ended wedge element having a neck from which flared ends of increasing cross-sectional area extend in both axial directions along the rod, and

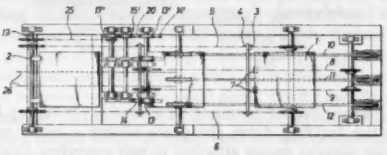
concentrically mounting to said wedge element an anchoring fitting with said anchoring fitting radially compressing said wedge element over said neck and said flared ends in the absence of an axial load on the rod.

4,130,927

PROCESS AND AN APPARATUS FOR THE CONTINUOUS MECHANICAL FABRICATION OF STARTING SHEETS FOR THE ELECTROLYTIC REFINING OF METALS, ESPECIALLY COPPER

Ralph Bengtsson, and Gunnar Larsson, both of Karlstad, Sweden, assignors to C J Wennberg AB, Sweden

Filed Apr. 26, 1977, Ser. No. 790,871
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 2618679; Oct. 2, 1976, 2644631
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432.1 31 Claims



1. A process for a continuous mechanical fabrication of starting sheets for an electrolytic refining of metals, especially copper, from pre-dimensioned and pre-straightened electrodeposited sheets, the process comprising the steps of:

continuously moving the respective starting sheets forward along a predetermined path of movement at a substantially constant rate of advance,

imparting a movement component to components to be connected to the starting sheets and to tools for connecting the components to the starting sheets in a direction parallel to the predetermined path of movement of the starting sheets at a speed which substantially corresponds to the rate of advance of the starting sheets, and

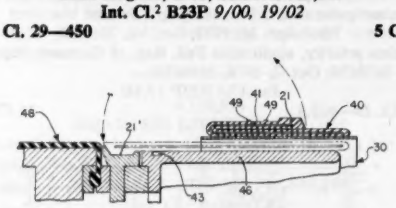
connecting the respective starting sheets to a cathode bar by supporting eyes by intermittently operating the tools which are arranged at predetermined positions along the predetermined path of movement of the starting sheets.

9. An apparatus for a continuous mechanical fabrication of starting sheets for an electrolytic refining of metals from predimensioned and pre-straightened electrodeposited sheets, the respective starting sheets being adapted to be connected by supporting eyes to a cathode bar, the apparatus including transporting means for transporting the respective starting sheets and cathode bars, means for continuously driving the transporting means at a constant speed, means for punching the respective starting sheets and supporting eyes, and means for mechanically establishing a firm rigid connection between the supporting eyes and the respective starting sheets, characterized in that the transporting means includes a first conveyor means for advancing the cathode bars including carrier means for carrying the cathode bars, and second conveyor means for advancing the respective starting sheets including stop means for engaging at least a portion of the respective starting sheets, means for operatively connecting said first and second conveyor means to said driving means such that said first and second conveyor means are driven at substantially the same speed thereby maintaining a constant interval between the cathode bar and the starting sheet during an advancing movement at least over a first portion of the transporting means, stationary means for picking up and holding sheet metal strips and for forming the sheet metal strips into the supporting eyes, said stationary means are arranged such that the sheet metal strips are bent around the cathode bar during the advancing movement of the starting sheets and cathode bars so that ends of the supporting eyes formed from the sheet metal strips rest on both sides of the starting sheet at an upper end thereof, and in that means are provided for mounting the punching means and the mechanical connection means so as to be displaceable to thereby connect the ends of the supporting eyes to the respective starting sheets.

4,130,928
METHOD FOR MOUNTING A TIRE BLADDER

Richard C. von der Heyde, Warken, and William J. Head, Rollingen (Mersch), both of Luxembourg, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Aug. 30, 1976, Ser. No. 719,047
Int. Cl.² B23P 9/00, 19/02
U.S. Cl. 29—450 5 Claims

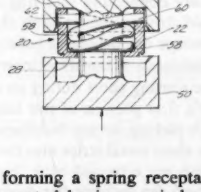


1. The method of mounting an inflatable ply turnup bladder on a tire building drum, the drum having a center part and bladder support means attached to and extending axially outward from the respective ends of the center part and mounted rotatably on a cantilevered shaft supported rotatably in a tire building machine housing, the drum having inflation means therein for conducting air to said turnup bladder, said method providing for mounting said bladder on one of said support means between said part and said housing while said drum is mounted on said shaft and without disassembly of any part of the drum, and comprising placing a collapsible form means in coaxial engagement with the radially inward surface of said bladder apart from said drum and in the deflated condition thereof, said form means being at least equal in axial length to the axial length of said bladder when the same is expanded, expanding the form means and the bladder therearound by an inflatable expanding means and fixing the so-expanded form means at a diameter sufficiently greater than the maximum diameter of said drum, then collapsing said expanding means and passing the form means freely coaxially thereover to locate said bladder in axial register with the one of said support means adjacent said housing then collapsing said form means while the bladder is in axial register with said one bladder support means and removing the collapsed form means from between the bladder and the bladder support means, whereby said ply turnup bladder is mounted on the drum without removal or disassembly thereof from said building machine housing.

4,130,929
WOUND SPRING RECEPTACLE

Julius F. Dzus, Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.

Filed Nov. 17, 1977, Ser. No. 852,553
Int. Cl.² B23P 19/04
U.S. Cl. 29—456 9 Claims

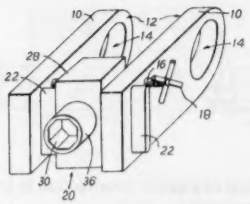


1. Method of forming a spring receptacle for removable engagement with a stud having a spiral cam slot therein to form a fastener to couple two members together comprising; forming a hollow receptacle body open on at least one end and with means thereon for mounting the receptacle to one of the members to be coupled and an opening therein alignment with an opening in the one member, locating a pair of opposed holes in the body, passing an elongated wire of spring material through the holes and the wire being long enough to extend across the body and outwardly therefrom through the holes, and holding one of the body and wire and rotating the other of the body and wire a predetermined amount causing the wire to coil within the body to form an integral coil spring and cross bar fixed in the body so that when the receptacle is mounted on the one member and engaged with the stud mounted on the other member and extended through the opening in the one member and into the body, relative rotation between the stud and receptacle will cause the coil spring to deflect as the cross bar follows the cam slot in the stud to the fastened position coupling the two members together.

4,130,930
LOCATING LOCK CASES IN DOORS

Desmond E. C. Webster, 1 Sweetmount Park, Dublin 14, Ireland

Filed Jul. 29, 1977, Ser. No. 820,103
Claims priority, application United Kingdom, Aug. 9, 1976, 33151/76
Int. Cl.² E05C 1/08; E06B 1/00
U.S. Cl. 29—466 11 Claims

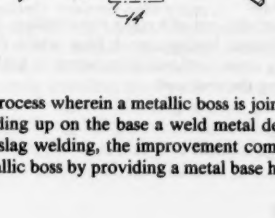


9. A method of installing a latch bolt case having a first non-circular alignment portion in a door having a cross-hole and a latch bolt casing passageway intersecting the cross-hole, employing a jig having a second non-circular alignment portion complimentary to the first alignment portion and a third generally alignement portion, the steps of positioning said jig with said third alignment portion in engagement with a major surface of the door and engaging said first alignment portion with the second alignment portion, driving said latch bolt case in an end-wise relation into said latch bolt passageway while maintaining the first and second alignment portions in engagement to prevent rotation of the latch bolt case as it is driven into the door.

4,130,931
ELECTROSLAG BOSS AND PROCESS

James E. Norcross, Media, Pa., assignor to Arcos Corporation, Philadelphia, Pa.

Filed Feb. 11, 1976, Ser. No. 657,325
Int. Cl.² B22D 11/126
U.S. Cl. 29—527.5 11 Claims



1. In the process wherein a metallic boss is joined to a metal base by building up on the base a weld metal deposit formed from electroslag welding, the improvement comprising forming said metallic boss by providing a metal base having therein

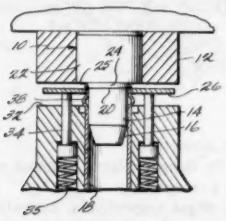
a hole completely peripherally enclosed by metal of the base defining said hole, wherein prior to building up said weld metal deposit, said hole is filled with metal by forming molten metal in said hole, said molten metal being formed in said hole from electroslag deposited metal and from the melting of portions of the base contiguous said hole with heat generated by said electroslag welding, and cooling said molten metal thereby metallurgically integrating said electroslag metal with metal of the base in the region of said hole, thereby forming said metallic boss which protrudes from said base.

4,130,932

METHOD OF JOINING A TUBE TO A PLATE

Robert T. Epmeier, Evansville, Ind., assignor to Arkla Industries, Inc., Evansville, Ind.

Filed Nov. 11, 1975, Ser. No. 630,896
Int. Cl.² B21D *39/08;* B23P *11/02*
U.S. Cl. 29—523 **3 Claims**



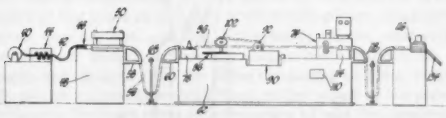
1. A method for joining a tube to a plate comprising: inserting the tube through a walled aperture in the plate so that an end portion of the tube extends beyond one side of the plate and so that the body of the tube extends beyond the other side of the plate; clamping a portion of the tube body in an outer die; axially aligning with the tube an inner die having a body the cross section of which is less than the cross section of the bore of the tube and having a shoulder the cross section of which is greater than the cross section of the bore of the tube; effecting relative movement between said inner and outer dies toward each other whereby the inner die body enters the tube and whereby the shoulder on the inner die engages the wall of the tube and transmits axial and radial force thereto so as to in sequence radially expand the wall of the tube into tight engagement with the wall of the aperture, move said end portion and body of the tube toward each other to buckle the tube wall adjacent said other side of the plate thereby forming a double-walled annular flange which engages said other side of the plate, and fold said end portion of the tube radially outwardly to form an annular flange engaging said one side of the plate.

4,130,933

FORMING AND COATING APPARATUS

Carl J. Demrick, Birmingham, Mich., assignor to Arco Industries Corporation, Schoolcraft, Mich.

Filed Sep. 12, 1977, Ser. No. 832,700
Int. Cl.² B23P *23/00;* B21B *15/00;* B21F *11/00*
U.S. Cl. 29—564 **25 Claims**



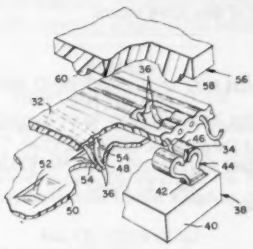
1. An apparatus for forming and coating parts comprising a first forming die, means for supplying metal stock to said die, said die being intermittently actuated to form a plurality of metal parts having depending portions, said formed parts being interconnected by integral tabs so as to form a continuous and flexible part strip, a part coating station downstream of said forming die, a mechanism for drivingly engaging and moving said part strip at a continuous rate of feed through said part coating station, the rate of movement of said part strip from said forming die being different than its rate of movement through said coating station, a first strip accumulator device disposed between said forming die and said coating station to control the operation of said forming die and to regulate the quantity of formed part strip supplied to said coating station, said coating station including a high energy heating device, guide means for conveying said part strip proximately over said heating device to heat the depending portions of said strip parts, means for applying a plastic coating to the heated depending portions of said part strip, a second die downstream of said coating station for severing said parts from said strip, means for intermittently feeding said plastic coated part strip to said second die, the rate of movement of said part strip through said coating station being different than its rate of movement through said second die, and a second strip accumulator disposed between said coating station and said second die to control the operation of said second die and to regulate the quantity of plastic coated part strip fed thereto.

4,130,934

METHOD FOR TERMINATING HIGH DENSITY CABLE

John C. Asick, Harrisburg, and Clifton W. Huffnagle, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 6, 1977, Ser. No. 858,128
Int. Cl.² H01B *7/08, 13/00;* H02G *1/14*
U.S. Cl. 29—628 **13 Claims**



1. A method for preparing multi-conductor flat cable for termination, said cable having a plurality of parallel spaced conductors encased in insulation, said method comprising the steps of:

cutting at least a longitudinal slit in the insulation adjacent each conductor to be terminated;

applying force to said conductor from one side of the cable causing said conductor to form a loop exposed from the other side of said cable; and

terminating each said conductor by inserting said exposed loop between resilient conductor engaging portions of an electrical terminal making good electrical and mechanical contact therebetween.

4,130,935

QUILTING BUTTON PART HOLDER

Arthur J. Randolph, Santa Rosa, Calif., assignor to Tuftamatic, Inc., Santa Rosa, Calif.

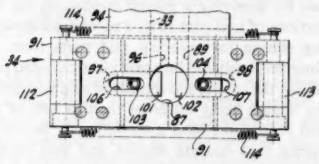
Continuation-in-part of Ser. No. 748,132, Dec. 6, 1976, Pat. No. 4,059,889. This application Oct. 12, 1977, Ser. No. 841,305
Int. Cl.² B23Q *7/10*
U.S. Cl. 29—706 **4 Claims**

1. A button part holder for a quilting machine adapted to

drive a flanged male button part downwardly by drive means into a female button part comprising

a holder plate having a circular opening therethrough with a pair of slots extending through said plate and disposed in alignment on opposite lateral sides of said opening and a feed slot extending through said plate from a side thereof to said opening and disposed perpendicularly to said pair of slots,

a pair of retainers pivotally mounted one in each of said pair of slots and normally extending into said central plate opening with a space between adjacent edges therein, and



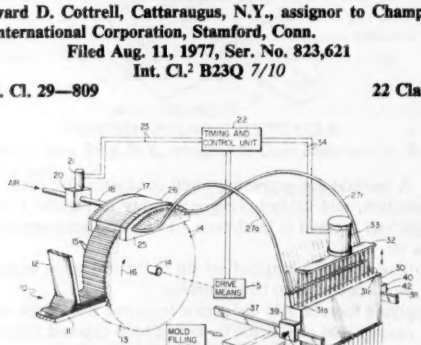
resilient means connected to said retainers and urging same into normal unpivoted position in alignment with an upper surface of said plate whereby said plate is adapted to receive a flanged button part moved onto the plate with a depending portion of the button part moved through said feed slot to support the button part by the flange thereof resting upon said retainers within said central plate opening and allowing said retainers to pivot downwardly in the slots wherein they are mounted as a button part is driven downwardly through the central opening in said plate and pivoting said retainers back into normal position upon retraction of said drive means.

4,130,936

STICK HANDLING AND INSERTING METHOD AND APPARATUS

Edward D. Cottrell, Cattaraugus, N.Y., assignor to Champion International Corporation, Stamford, Conn.

Filed Aug. 11, 1977, Ser. No. 823,621
Int. Cl.[2] B23Q *7/10*
U.S. Cl. 29—809 **22 Claims**



1. An apparatus for delivering and inserting handle sticks into a plurality of molds for use in combination with a machine having means for filling said molds and moving groups of the filled molds along a predetermined path, the apparatus comprising:

an insertion station located along and above said predetermined path;

a stick feeding station at a location separate and spaced apart from said insertion station;

means for conveying said sticks from said feeding station to said insertion station; and

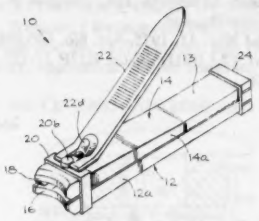
means for mounting said insertion station for longitudinal adjustment relative to said predetermined path independently of said feeding station.

4,130,937

NAIL CLIPPER

Young M. Kim, 511 N. Bandini, San Pedro, Calif. 90731

Filed Feb. 10, 1978, Ser. No. 876,695
Int. Cl.[2] A45D *29/02*
U.S. Cl. 30—28 **4 Claims**



1. A nail clipper, comprising:

(a) two bilaterally flanged plates mounted within one another to form a receptacle;

(b) two cutting edges respectively, extending facing one another from one end of the plates;

(c) a band encompassing the two plates fastened to one of the plates;

(d) a lever mounted turnably on the band, each surface of the lever having a protuberance alternately constituting a fulcrum between lever and plate surface, respectively abutting the plate surface, causing the cutting edges to close;

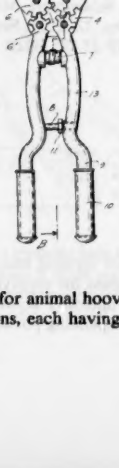
(e) a closure covering the other end of the receptacle forming two plates.

4,130,938

CUTTER FOR ANIMAL HOOVES AND CLAWS

Georg Uhlmann, Bendorf, Germany, assignor to Rheintechnik Weiland & Kaspar K.G., Neunkirchen, Germany

Continuation-in-part of Ser. No. 513,514, Oct. 9, 1974, abandoned. This application Jul. 9, 1976, Ser. No. 703,935
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1973, 2350999
Int. Cl.[2] B26B *17/00*; A01L *11/00*
U.S. Cl. 30—192 **10 Claims**



1. A cutter, particularly for animal hooves and claws, comprising a pair of jaw sections, each having a first end portion

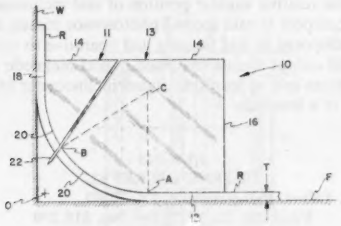
defining a first gear member; a cutting element mounted on each of said jaw sections and arranged to cooperate with one another so as to permit severing of articles placed between said jaw sections; a pair of handle sections for activating said jaw sections and each having a second end portion defining a second gear member; and mounting means mounting said jaw sections for pivotal movement relative to one another so that each of said first gear members is arranged for interengagement with the other first gear member, and each of said second gear members is arranged for interengagement only with a respective one of said first gear members while being free of interengagement with the respective other second gear member.

4,130,939

WALL EDGE TRIMMERS FOR RESILIENT FLOOR COVERINGS

Hugh Toal, Kearny, N.J., assignor to Congoleum Corporation, Kearny, N.J.

Filed Aug. 11, 1977, Ser. No. 823,819
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—293 **4 Claims**



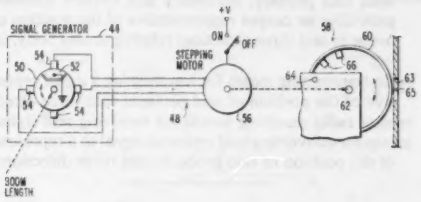
1. A wall edge trimmer for resilient floor coverings comprising: a flat, horizontally planar, relatively smooth base surface capable of sliding along the surface of a resilient floor covering laid out on a floor; a flat, vertically planar, relatively smooth front surface lying in a plane substantially at right angles to the plane containing said flat, horizontally planar, relatively smooth base surface and capable of sliding along the surface of a portion of said resilient floor covering which is curled upwardly and contacts the lowermost portion of a wall; said flat, horizontally planar, relatively smooth base surface and said flat, vertically planar, relatively smooth front surface possessing sufficient flat, planar surfaces whereby said wall edge trimmer is capable of steady, stable, non-rocking sliding motion along the surface of said resilient floor covering; an upper or top surface; a rear surface connecting said upper or top surface and said flat, horizontally planar, relatively smooth base surface; a relatively smooth arcuate surface in the form of a quarter cylinder connecting said flat, horizontally planar, relatively smooth base surface and said flat, vertically planar, relatively smooth front surface; a cutting tool intersecting said arcuate surface and extending from a point within said wall edge trimmer to a point beyond said arcuate surface; and means capable of adjusting said cutting tool into parallel planes laterally of itself to always maintain said cutting tool at a constant angular relationship of from about 33° to about 60° with respect to the plane of said flat, horizontally planar, relatively smooth base surface, said flat, horizontally planar, relatively smooth base surface contacting said arcuate surface at a straight-line distance from the plane containing said flat, vertically planar, relatively smooth front surface equal to the arcuate distance from the point of intersection of said flat, horizontally planar, relatively smooth base surface and said arcuate surface to the point of intersection of said arcuate surface and said cutting tool, as measured along said arcuate surface, said straight-line distance and said arcuate distance both being equal in length to the radius of said quarter cylinder.

4,130,940

BOOM LENGTH SENSING AND INDICATING SYSTEM WITH SELF-SYNCHRONIZATION

Dennis G. Densmore, Waverly, Iowa, assignor to Koehring Company, Brookfield, Wis.

Filed Dec. 16, 1977, Ser. No. 861,370
Int. Cl.[2] G01B *3/12*
U.S. Cl. 33—139 **9 Claims**



1. A boom length indicating system for a crane of the type having an operator's cab comprising:

means mounted on the boom of the crane for sensing changes in the extended length of the boom and for generating a signal representative of the sensed changes;

a boom length indicator mounted in the cab of the crane and movable to indicate the extended length of the boom;

means drivingly connected to the indicator for receiving the generated signal representative of the sensed changes and driving the indicator by an amount and in a direction related to the sensed changes; and,

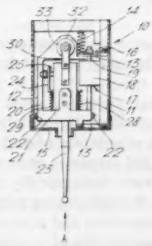
means cooperating with the indicator to prevent movement of the indicator beyond predetermined upper and lower extremities of indicator movement regardless of sensed changes in the extended length of the boom.

4,130,941

DISPLACEMENT GAUGE

Clifford R. Amsbury, King's Newton, England, assignor to Rolls-Royce Limited, London, England

Continuation of Ser. No. 667,444, Mar. 16, 1976, abandoned. This application Aug. 18, 1977, Ser. No. 825,704
Claims priority, application United Kingdom, Mar. 20, 1975, 11542/75
Int. Cl.[2] G01B *07/02*
U.S. Cl. 33—174 L **6 Claims**



1. A displacement indicating gauge for attachment to a movable head of a machine adapted to perform measuring operations comprising:

a body;

a probe;

primary, secondary and tertiary members;

first means for mounting said primary member on said body;

second means for mounting said secondary member on said primary member;

third means for mounting said tertiary member on said sec-

ondary member, said first, second and third mounting means permitting relative movement between said body and said primary member, said primary member and said secondary member, and said secondary member and said tertiary member in first, second, and third mutually substantially perpendicular directions, respectively;

means mounting said probe on said tertiary member with said probe extending beyond the bounds of said body;

three displacement sensing means respectively cooperating with said primary, secondary and tertiary members for providing an output representative of the position of said probe in said three directions relative to said body, including

radio transmitting means for transmitting a signal representative of the position of said probe in said three directions;

remote radio receiving means for receiving said signal; and

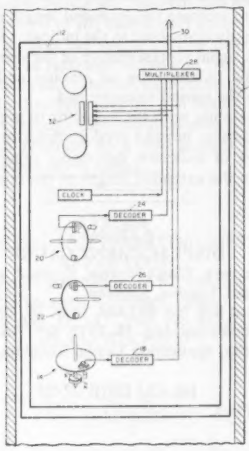
means for converting said received signal to a representation of the position of said probe in said three directions.

4,130,942

BOREHOLE SURVEYING APPARATUS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Filed May 26, 1977, Ser. No. 800,93?
Int. Cl.[2] G01C *9/04*
U.S. Cl. 33—312 **6 Claims**



1. Borehole survey apparatus comprising:

a non-magnetic housing adapted for disposition in a borehole;

a digital magnetic compass disposed within said housing and operative to provide a digital output signal representative of the azimuth orientation of said housing;

wherein said digital magnetic compass includes:

a normally stationary disk optically coded with a plurality of concentric tracks each having a different number of alternately light responsive and non-responsive segments representing respective bits of a multi-bit code;

a compass magnet affixed to and rotatable with said disk;

means for mounting said disk and magnet for rotation about a normally vertical axis to permit alignment of the magnet with the earth's magnetic field to provide a relative angular position of said disk indicative of compass heading;

means for illuminating the coded tracks of said disk; and

photosensor means including a photosensor array having a plurality of photosensitive elements each in alignment with a respective coded track and operative to receive light from the coded tracks of said disk and to provide in response thereto a plurality of digital signals corresponding to a multi-bit code representing the relative angular position of said disk with respect to said photosensor means;

at least one digital inclinometer disposed in said housing and operative to provide a digital output signal representative of the inclination of said housing with respect to a predetermined vertical plane;

wherein said at least one digital inclinometer includes:

a normally stationary disk optically coded with a plurality of concentric tracks each having a different number of alternately light responsive and non-responsive segments representing respective bits of a multi-bit code;

means for mounting said disk for rotation about a normally horizontal axis;

a weight disposed at the lower portion of said inclinometer disk to define a normal position when said housing is vertically aligned;

means for illuminating the coded tracks of said inclinometer disk; and

second photosensor means including a photosensor array having a plurality of photosensitive elements each in alignment with a respective coded track and operative to receive light from the coded tracks of said inclinometer disk and to provide in response thereto a plurality of digital signals corresponding to a multi-bit code representing the relative angular position of said inclinometer disk with respect to said second photosensor means; and

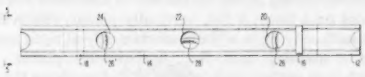
means disposed in said housing and operative to convey the digital output signals from said digital magnetic compass and from said at least one digital inclinometer to the surface of a borehole.

4,130,943

EXTENSION LEVEL

Claude J. Talbot, Paincourtville, La. 70391

Filed Jul. 22, 1977, Ser. No. 818,239
Int. Cl.[2] G01C *9/34*
U.S. Cl. 33—374 **10 Claims**



1. An extension level device extendable between a collapsed position and a fully extended position comprising:

an elongated base member having mutually spaced apertures therethrough including a centrally located aperture, the apertures disposed along the longitudinal axis thereof and a spirit level vial mounted in the centrally located aperture thereof;

first and second extension members slidably mounted on opposed longitudinal faces of said base member, the longitudinal axes of said extension members and said base lying in a common plane, each of said members having a plurality of mutually spaced apertures therethrough disposed along the longitudinal axis of each of said members and first and second spirit level vials, said first vial mounted in an aperture in said first member and said second vial mounted in an aperture in said second member;

adjacent apertures in said base and first and second members being spaced longitudinally an equal distance apart and both ends of said base member and one end of each of said first and second members defining half circles having centers lying on the longitudinal axis of said member spaced thereon said equal distance from adjacent apertures;

means carried by said device for permitting only longitudinal movement of said first and second members relative to said base;

locking means carried by said device for releasably coupling

said first and second members and said base member against relative longitudinal movement.

4,130,944

CENTRIFUGAL FLUIDIZED-BED DRYING METHOD AND APPARATUS

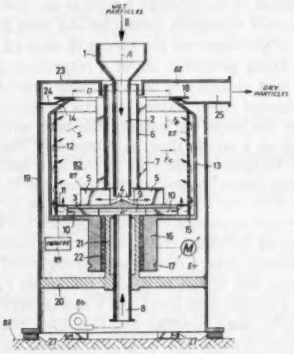
Günther Hultsch, and Harald Bock, both of Munich, Germany, assignors to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed May 19, 1977, Ser. No. 798,486

Claims priority, application Fed. Rep. of Germany, May 20, 1976, 2622565

Int. Cl.² F26B *5/08*

U.S. Cl. 34—8 **19 Claims**



1. A method of treating particles comprising the steps of:

(a) forming said particles into a body of particles centered on an axis;

(b) rotating said body of particles about said axis at a speed sufficient to urge said particles radially outwardly with a centrifugal force;

(c) passing a drying gas in a direction substantially opposite the centrifugal force inwardly through said body all around the latter and thereby contacting said particles and drying same; and

(d) maintaining the speed of the gas in said direction at a level sufficient to counter the centrifugal force and keep said particles in a suspended state.

6. An apparatus for drying wet particles, said apparatus comprising:

a vessel adapted to receive wet particles and having a circular cross section with an axis, a foraminous wall surrounding said axis and inlet means for admitting said particles to the vessel;

drive means for rotating said vessel and particles therein about said axis at an angular speed sufficient to urge said particles radially outwardly with a centrifugal force;

a housing spacedly surrounding said vessel and defining a space around said vessel;

drive means for rotating said housing; and

blower means for passing a drying gas through said space and at least partially radially inwardly through said foraminous wall and generally opposite to the centrifugal force at a speed sufficient to keep said particles in a suspended state along said wall.

4,130,945

METHOD FOR THE PRODUCTION OF FINE-GRAINED MIXTURE OF MINERAL SOLIDS

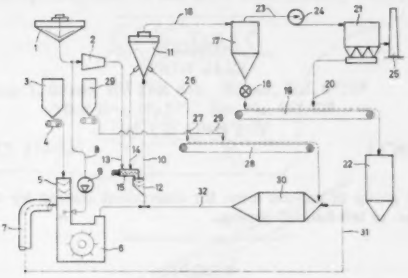
Kunibert Brachthäuser, Bensberg, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Sep. 6, 1977, Ser. No. 830,996

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1976, 2640044

Int. Cl.² F26B *3/08*

U.S. Cl. 34—10 **3 Claims**



1. A method for the production of a mixture of fine-grained mineral solids from at least two components, each forming an essential part of the mixture, the first of said components being in the form of a slurry and the second of said components being a relatively coarse, moist mineral material, which comprises:

partially dehydrating said slurry,

mixing a portion of the partially dehydrated slurry with said second component in a mill while introducing hot drying gases into said mill,

passing the output of said mill into a sifter,

further dehydrating the remainder of said partially dehydrated slurry,

mixing the futher dehydrated remainder with particulate matter recovered from said sifter to produce a relatively moist mixture, and

combining said relatively moist mixture with the output of said mill en route to said sifter.

4,130,946

EDUCATIONAL DEVICE FOR MOTIVATING, AND FOR DEVELOPING SCRIBING AND READING SKILLS IN, THE HANDICAPPED

William J. Coady, 1732 W. Jackson St., Springfield, Ill. 62704

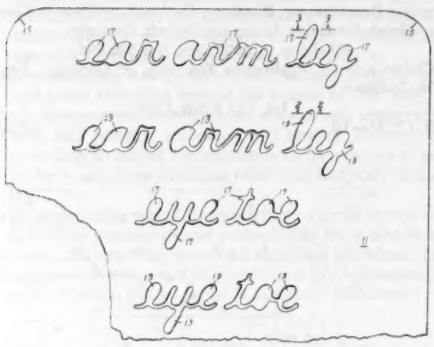
Continuation-in-part of Ser. No. 619,780, Oct. 6, 1975, abandoned, which is a continuation-in-part of Ser. No. 495,919, Aug. 8, 1974, abandoned. This application Jul. 11, 1977, Ser. No. 814,424

Int. Cl.² G09B *11/04*

U.S. Cl. 35—37 **6 Claims**

1. An educational device, especially useful for physically and/or mentally handicapped persons, comprising: a semi-rigid lamina having at least one group of interconnected cut-out areas of conventional cursive symbol configurations, the margins of said areas being adapted to serve as guides for a manually held scribing implement, and said at least one group of areas having, through symbol combination, learning-stimulating verbal conceptual significance; at least one group of raised symbols, matching said cut-out areas and usable with said lamina, whereby visual sensing, and/or tactile sensing by a second hand, can be effected while a first hand is being guided by said scribing implement and the margins of said

cut-out areas, said at least one group of raised symbols being fixedly positioned directly above and parallel to said at least



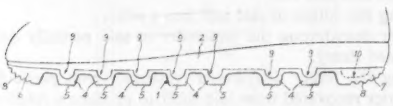
one group of cut-out areas for convenient sensing by either right- or left-handed persons.

4,130,947

SOLE FOR FOOTWEAR, ESPECIALLY SPORTS FOOTWEAR

Francis Denu, La Walk, France, assignor to Adidas Fabrique de Chaussures de Sport, Landersheim, France

Filed Jul. 28, 1977, Ser. No. 819,677
Claims priority, application France, Jul. 29, 1976, 76 23173
Int. Cl.[2] A43B *13/12*; A43C *15/00*
U.S. Cl. 36—30 R **8 Claims**



1. A sole for footwear comprising a lower layer of abrasion-resistant material having a lower surface comprising a plurality of downwardly-projecting ribs to touch the ground, the ribs being substantially perpendicular to the longitudinal axis of the footwear, and an upper layer of impact-absorbing material attached to the lower layer, and in which the upper surface of the lower layer is provided with grooves corresponding to the ribs, the grooves extending to the sides of the sole and being occupied by corresponding downwardly-projecting portions of the upper layer.

4,130,948

SHOE INSERT

Hans-Dietrich Krug, Heidelberg, Germany, assignor to Firma Carl Freudenberg, Weinheim, Germany

Filed Aug. 25, 1977, Ser. No. 828,009
Claims priority, application Fed. Rep. of Germany, Sep. 2, 1976, 7627371[U]
Int. Cl.[2] A43B *13/38*; B32B *3/26*
U.S. Cl. 36—44 **1 Claim**

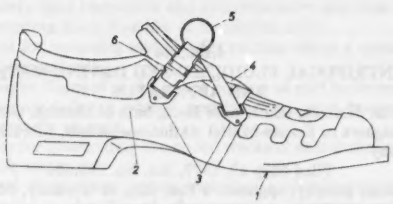
1. A shoe having a multi-layered insert disposed in said shoe against the shoe sole, each of the layers of said insert formed of a closed-cell, cross linked polyolefin foam, said layers having different resiliency from on another, the layer of said insert disposed against the shoe sole having a specific gravity of 0.03 to 0.08 and the layer of said insert to be disposed against the foot of the user having specific gravity of 0.06 to 0.175, the specific gravity of the respective layers increasing progressively from the layer disposed against the shoe sole to the layer to be disposed against the user's foot, said shoe insert conforming to the shape of said shoe.

4,130,949

FASTENING MEANS FOR SPORTS SHOES

Sigurd Seidel, Graz, Austria, assignor to Skischuhfabrik Dynafit Gesellschaft, Graz, Austria

Filed Jan. 21, 1977, Ser. No. 760,993
Claims priority, application Austria, Jan. 22, 1976, 413/76
Int. Cl.[2] A43B *11/00*; A43C *1/00*
U.S. Cl. 36—50 **4 Claims**



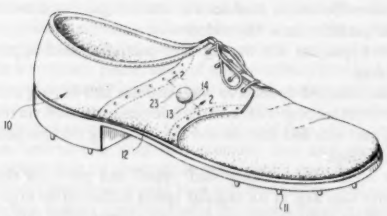
1. Fastening means for a sports shoe, comprising a flexible lace, a plurality of buckles, a one-way clip, and mounting means for mounting each of said plurality of buckles to respective portions of an upper of a shoe at the points of reversal of the lace, said mounting means having axes generally perpendicular to the upper of the shoe and each of said plurality of buckles being pivotable about a respective one of said axes, each of said plurality of buckles being provided with a rotatably mounted roller having an axis generally parallel to the upper of the shoe for guiding the lace when said buckle is mounted on a sports shoe, said one-way clip having a frame member secured to one end of the lace and being provided with guide means for guiding the other end of the lace through said one-way clip so as to permit the same to move in a direction in which tension is applied to tighten the flexible lace, said guide means including releasable locking means for preventing an unintended return movement through said one-way clip of the guided end of the lace, said releasable locking means including a double-arm lever and a spring having one end bearing on said frame member and the other end bearing on one arm of the double-arm lever for biasing said one arm into locking engagement with said guided end of said lace.

4,130,950

SHOE INCLUDING GOLF BALL POSITION MARKER

Lillian M. Bazzle, Williamsburg, and Marshall J. Staton, Hampton, both of Va., assignors to Lillian Mae Bazzle, Williamsburg, Va.

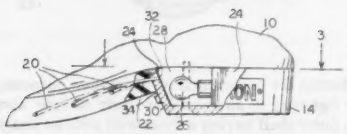
Continuation of Ser. No. 683,486, May 5, 1976, abandoned. This application May 3, 1977, Ser. No. 793,250
Int. Cl.[2] A63B *57/00*
U.S. Cl. 36—127 **5 Claims**



1. In combination a shoe, golf ball position marker, and magnet support incorporated in the shoe for releasably magnetically retaining the ball position marker in supported relation on the shoe, said shoe having a sole and an upper extending above the shoe sole providing a foot receiving cavity, the shoe upper including a first base layer, and a second outer layer which is in direct engagement with said first base layer to reinforce the base layer at the instep of the shoe, said golf ball

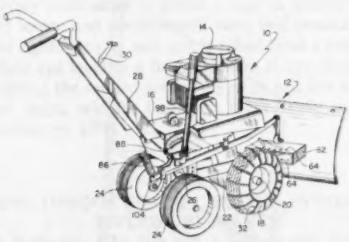
position marker being of magnetizable material capable of being attracted to and held by said magnet support, said magnet support being a magnet securely mounted in fixed relation in an opening in said second outer layer at a location overlying the outer side of the instep portion of the shoe for removably retaining the ball position marker by magnetic attraction forces and permitting said ball position marker to be removed from said shoe by sliding same sideways along said magnet to a position overlying said second outer layer whereby said marker may be easily grasped and removed in one single hand movement along the outer side of said shoe.

4,130,951
ILLUMINATED DANCING SHOES
Aaron Powell, P.O. Box 2331, Hollis, N.Y. 11423
Filed Sep. 9, 1977, Ser. No. 831,960
Int. Cl.[2] A43B *23/00*
U.S. Cl. 36—137 **9 Claims**



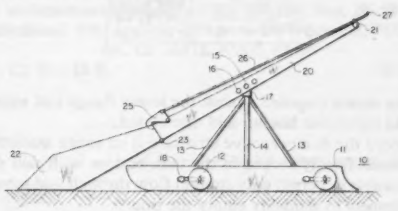
1. An illuminated shoe comprising, in combination
a heel having a cavity;
a source of light mounted in said cavity for furnishing light when energized;
energizing means connected to said source of light for furnishing electrical energy thereto;
a sole extending forwardly from said heel, said sole having an edge defining the outer perimeter thereof, said edge having at least one light emitting portion; and
at least one optical fiber embedded in said sole and having one end positioned to receive light from said source of light and a second end positioned near said light transmitting portion in said edge of said sole, whereby said light transmitting portion is illuminated when said source of light is energized.

4,130,952
PLOW ATTACHMENT FOR ROTO-TILLER
Exsior Dion, 547 River Rd., Lincoln, R.I. 02865
Filed Sep. 23, 1977, Ser. No. 836,244
Int. Cl.[2] E01H *5/04*; A01B *65/06*
U.S. Cl. 37—41 **6 Claims**



1. A material pushing attachment for a roto-tiller having a frame, front mounted tines, rear guide wheels, and means for driving said front mounted tines including a gear housing downwardly extending from said frame between said front wheels, said attachment including a pair of front driving wheels adapted to replace said tines, a yoke in turn having a blade attached at the forward end thereof and including a pair of parallel rearwardly extending members positioned so as to straddle said gear housing and pivotally mounted at the rear ends thereof to opposed legs downwardly extending from said frame, a lift-lever having an intermediate section thereof connected to said frame for pivotal movement with respect thereto, the forward end of said lift lever extending above the forward end of said yoke and pivotally interconnected thereto, and combination adjustment and stop means for moving the rear end of said lift lever so as to raise and lower said blade, said adjustment and stop means mounted on said frame proximal the rear wheels and spring means for constantly urging said lever rear end upwardly against said stop mens so as to prevent upward travel of said blade when pushing material.

4,130,953
SNOW JACK
Anthony T. Bruno, 103 19th Ave., Belmar, N.J. 07719
Filed Dec. 19, 1977, Ser. No. 861,719
Int. Cl.[2] E01H *5/02*
U.S. Cl. 37—130 **4 Claims**



1. A manual device for removing snow comprising: a sled; a pedestal extending upwardly from the center portion of said sled; a lever arm; a handle at one end of said lever arm; a snow scoop at the other end of said lever arm; said snow scoop being coupled to the other end of said lever arm by a lower, horizontal hinge and an upper releasable catch; a release mechanism positioned adjacent to said handle; means for coupling said release mechanism to said releasable catch; means for coupling a first, horizontal pivoting mechanism to the center portion of said lever arm at the upper end of said pedestal; means for connecting a second, vertical pivoting means mecanism to said center portion of said lever arm at said upper end of said pedestal; and means for connecting said first horizontal pivoting mechanism and said second vertical pivoting mechanism to said pedestal to be supported thereby, whereby said snow scoop can be positioned in front of said sled, which can be moved forward until the scoop is full of snow, whereat the handle can be moved downwardly, to raise said scoop, and sidewardly to rotate said scoop to the side before actuating said release mechanism to drop said scoop load of snow.

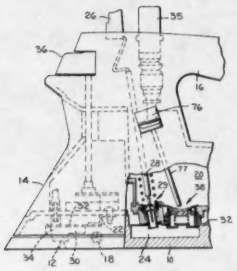
4,130,954
IRON SELF-CLEAN VALVE ASSEMBLY
Wendell C. Walker, Alta Loma, Calif., assignor to General Electric Company, Bridgeport, Conn.
Filed Oct. 11, 1977, Ser. No. 840,918
Int. Cl.[2] D06F *75/06*
U.S. Cl. 38—77.83 **5 Claims**

1. In a steam iron having a water tank, steam generating soleplate, a guided water valve movable between an on/off positon to direct water to the soleplate for steam generation, and a dumper valve in the tank bottom operable to suddenly empty the tank onto the soleplate to purge and clean the iron, the improvement in said dumper valve comprising,
a unitary assembly including, a flat smoothly continuous tubular member fixedly disposed with its upper end connected to the bottom of said tank and extending with its lower end towards the soleplate,
a second concentric smoothly continuous tubular member telescopically disposed in frictional fixed engagement with said first member to lock the two together,
radial inwardly directed flange means at one end of each of

said tubular members and at opposite ends from each other,

said flanges defining reduced openings at the tubular upper and lower ends,

a vertically movable valve disc spanning the upper opening below its flange and peripherally spaced from said second tubular member, and



spring means disposed against the lower flange and against said valve disc biasing said disc closed,

whereby the dumper valve structure is an entire assembled subunit fixedly locked in the tank bottom with said disc movable to permit only straight flow through said tubular members to suddenly empty the iron.

4,130,955

PRESSING OR SMOOTHING IRON COMPRISING A SAFETY TURN-OFF MEANS LOCATED IN A HEATING CURRENT CIRCUIT

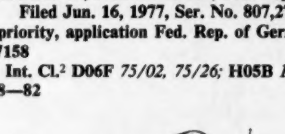
Erich R. Baumgartner, Tiroler Platz 4, and Peter Doehler, Kaulbachstrasse 59, both of Munich, Fed. Rep. of Germany

Filed Jun. 16, 1977, Ser. No. 807,272

Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 2627158

Int. Cl.[2] **D06F** *75/02, 75/26;* **H05B** *1/02*

U.S. Cl. 38—82 **14 Claims**



1. A pressing iron containing a safety turn-off means located in a heating-current circuit thereof and comprising:

an acceleration sensor for producing a signal in response to a predetermined acceleration of said pressing iron, said acceleration sensor including a movable means located in a channel, for freely moving to a lowermost portion of said channel under the influence of gravity, a channel forming means for forming said channel to have a lowermost portion thereof when said pressing iron is in a pressing attitude, but being shaped so that, upon acceleration of said pressing iron said movable means is moved out of said lowermost portion;

a detecting means for detecting predetermined motion of said movable means out of said lowermost portion and producing a signal in response thereto; and,

an actuating means operative in response to a predetermined level of said signal for actuating said safety turn-off means.

4,130,956

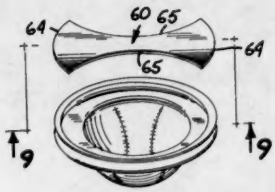
BUTTON AND APPARATUS FOR FABRICATION THEREOF

Albert W. Eddy, and Roger W. Lyngklip, both of Winona, Minn., assignors to Technigraph Corporation, Winona, Minn., by said Roger W. Lyngklip

Division of Ser. No. 528,787, Dec. 2, 1974, Pat. No. 3,997,052. This application Jun. 22, 1976, Ser. No. 698,749

Int. Cl.[2] **A44C** *3/00*

U.S. Cl. 40—1.5 **4 Claims**



1. A button for ornamental or expressive purposes and suitable for fastening to an unbroken fabric surface, comprising:

(a) an outer shell having a front wall with an image forming surface thereon and a generally transversely extending sidewall portion defining an inwardly facing peripheral groove, one side of said groove being spaced from said front wall, said groove having a diameter defined by a distance across said shell at the bottom of said inwardly facing groove;

(b) an elongated resilient removable inner cross member having a longitudinal dimension greater than said diameter and opposed contact edges shaped to substantially conform to said groove;

(c) said cross member being connected to opposing sides of said shell with said contact edges engaging the surface of said groove, whereby said cross member may initially assume an outwardly bowed position when a layer of fabric is placed between said cross member and said shell, and be forced to an inwardly bowed fastening position through an over-center action.

4,130,957

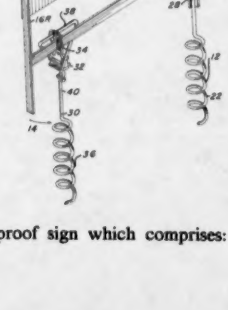
THEFT-PROOF SIGN

Marshall D. Hampton, 2125 S. Ammons, Lakewood, Colo. 80227

Filed Aug. 5, 1977, Ser. No. 822,132

Int. Cl.[2] **G09F** *15/00*

U.S. Cl. 40—607 **5 Claims**



1. The theft-proof sign which comprises: a metal frame

having a single corkscrew-shaped post for screwing same into the ground, laterally-extending means secured to said frame for rotation therewith extending beyond said post on at least one side thereof, a corkscrew-shaped stake adapted to be screwed into the ground in spaced relation alongside said post, and anchoring means detachably interconnecting said stake and frame effective to prevent sufficient rotation of either said stake or post to effect removal thereof from the ground.

4,130,958

GUN SIGHT

Jack E. Gutridge, 533 214th St., Dyer, Ind. 46311

Filed Apr. 27, 1977, Ser. No. 791,172
Int. Cl.[2] F41G *1/02*
U.S. Cl. 42—1 S **5 Claims**

1. A sighting device for use on a gun permitting quick and accurate alignment and immediate firing of said gun at a target in a single continuous motion from a point well below eye level to a firing position at eye level, said gun having a barrel with a muzzle end, said sighting device comprising:

a rear sight mounted on the end of said gun opposite said muzzle end, said rear sight having an aperture forming a first sighting point;

an elongated front sight mounted on said barrel adjacent said muzzle end and extending a substantial distance toward said first sighting point, said front sight having a sighting tip of a first color disposed adjacent said muzzle end and forming a second sighting point of maximum height, said first and second sighting points being alignable to form a sighting plane along said barrel;

said front sight tapering uniformly from a maximum height at said sighting tip to a point of minimum height forming an elongated unobstructed tapered surface, said elongated tapered surface having a central surface strip of a second color adjacent outer surface strips of said first color, said central surface strip extending from said sighting tip to said point of minimum height, said first and second colors sharply contrasting to permit a user to quickly peripherally locate and continuously view said central strip and said sighting tip as said gun is raised from a position well below eye level to a firing position at eye level, thereby enabling the user to accurately align and fire said gun at said target without hesitation immediately as said gun reaches eye level.

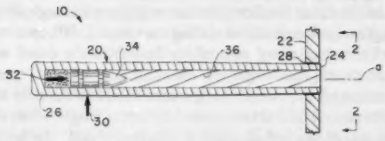
4,130,959

FIRING TORQUE ERROR CONTROL SYSTEM FOR RIFLED ORDINANCE

John S. Pedgonay, P.O. Box 127, Aberdeen, Md. 21001

Filed Jun. 15, 1978, Ser. No. 915,737
Int. Cl.[2] F41C *21/00*
U.S. Cl. 42—75 B **4 Claims**

1. In a rifled barrel system for firing a projectile and having means for constraining the muzzle thereof and a characteristic torsional rigidity between muzzle and breech about the longitudinal axis thereof, the improvement comprising: the means for constraining said muzzle proportioned for constraining the muzzle against torsional movement about the longitudinal axis with a rigidity greater than said characteristic torsional rigidity of the rifled barrel, and means permitting said torsional movement of the rifled barrel otherwise than at said means for constraining, upon firing.

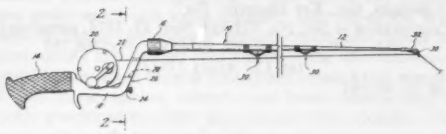


4,130,960

FISHING ROD AND HANDLE

Carl E. Fontenot, Lake Charles, La., assignor to Bass Handler Products Co., Inc., Lake Charles, La.

Continuation-in-part of Ser. No. 635,578, Nov. 28, 1975, abandoned. This application Apr. 4, 1977, Ser. No. 783,992
Int. Cl.[2] A01K *87/00, 87/04*
U.S. Cl. 43—18 R **6 Claims**



1. A fishing rod comprising,

a rod,

downwardly extending eyes secured to the rod and spaced below and along its length and adjacent its tip,

a handle having a lower portion and an integrally formed forward portion extending upwardly and forwardly from the lower portion,

means for securing a reel of fishing line to the lower portion, and

means for securing the rod to the upper end of the forward portion,

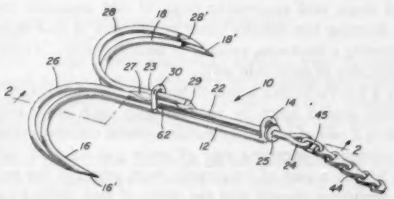
the forward portion including a pair of spaced legs providing an inverted, generally triangularly shaped opening with a rounded bottom and its altitude lengthwise extending therethrough below the rod in alignment with the eyes sufficient to allow the fishing line to extend therethrough without the fishing line rubbing sides of the opening in all fishing positions of the fishing line and rod.

4,130,961

FOLDING GRAPPLE FOR TRAPS

Herman I. Snow, 111 Davis Ave. North, Litchfield, Minn. 55355

Filed Feb. 11, 1977, Ser. No. 767,943
Int. Cl.[2] A01M *23/00*
U.S. Cl. 43—96 **3 Claims**



1. A folding grapple comprising, first and second anchor members each having an elongate shank and a pair of out-

wardly and oppositely extending hooks rigidly affixed on one end thereof, one of said anchor members having a pair of upstanding aligned eyes spaced along the length thereof, the shank of the other anchor member engaging through said eyes for lengthwise longitudinal sliding movement, 90° cam surface means extending along part of the length of the other anchor member shank and engaging through one of said eyes, the last-mentioned eye constituting a cam follower slidably engaging said cam surface means, whereby upon lengthwise relately movement of the other anchor member shank through said eyes, said other anchor member is rotated 90° between one condition in which the hooks on both anchor members are disposed in parallel planes and another condition in which the hooks lie in planes at right angles to one another.

4,130,962

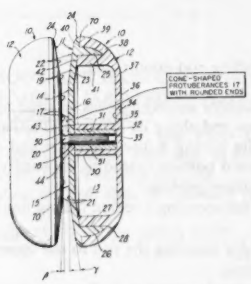
SUPERIOR PERFORMANCE YO-YO

Thomas H. Ennis, Chamblee, Ga., assignor to Jack Russell Company, Inc., Key Biscayne, Fla.

Continuation of Ser. No. 522,333, Nov. 11, 1974, abandoned. This application Jul. 19, 1976, Ser. No. 706,753

Int. Cl.² A63H *27/12*

U.S. Cl. 46—61 **12 Claims**



1. A Yo-Yo comprising an axle and a pair of opposed complementary body segments spaced apart by said axle, each of said segments including a circular inner shell, a circular outer shell and means non-rotatably joining them together to define a hollow interior, said shells being integrally molded of plastic, said means comprising intermeshing concentric rings at the peripheries of said shells, one shell of each of said segments having a first side wall and, as its portion of said concentric rings, two spaced rings protruding from said first side wall, the other shell of said each of said segments having a second side wall spaced from said first side wall and, as its portion of said concentric rings, a ring protruding from said second side wall and snuggly received and sandwiched between said two spaced rings, said concentric rings of said segments respectively forming the radially outer peripheries of said segments and forming a thickness, radially of such segments, in excess of the thickness of each side wall.

9. In a Yo-Yo having a pair of opposed complementary body segments spaced apart by an axle with each body segment including a pair of integrally molded plastic circular shells, the improvement comprising one of each pair of said circular shells having a pair of concentric rings adjacent the radially outer periphery thereof and the other of said shells having a ring fitted snugly between the pair of rings for non-rotatably joining together the shells of each segment and for weighting the segment periphery.

4,130,963

RUNNING TOY WITH A FLYWHEEL

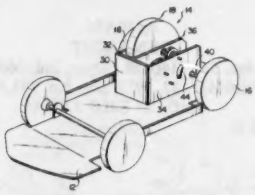
Yutaka Ohashi, Mibu, Japan, assignor to Tonka Corporation, Hopkins, Minn.

Filed Jun. 10, 1977, Ser. No. 805,511

Claims priority, application Japan, Jul. 13, 1976, 51-93510[U]; Feb. 28, 1977, 52-24264[U]

Int. Cl.² A63H *29/20*

U.S. Cl. 46—209 **10 Claims**



1. A running toy with a flywheel comprising a body, a base attached to said body, and a toy driving unit mounted on said base; said toy driving unit having a frame, at least one driving wheel, a flywheel, and a gear mechanism attached to said frame to couple said driving wheel and said flywheel, said gear mechanism forming a first transmission path with a first gear ratio to energize said flywheel so as to rotate said driving wheel at a first speed as compared to the flywheel when said driving wheel is driving said flywheel, and a second transmission path with a second gear ratio to rotate said driving wheel through said flywheel at a second speed as compared to the rotating speed of said flywheel when the driving wheel is driven by the flywheel, thereby rotatably driving said wheel at a speed different from that at time of energizing said flywheel.

4,130,964

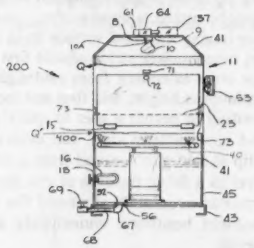
APPARATUS AND METHOD FOR GROWING LEGUME SPROUTS

Edward A. Caballero, 1216 Spruce Ave., Chico, Calif. 95926

Continuation-in-part of Ser. No. 636,818, Dec. 1, 1975, abandoned. This application Apr. 15, 1977, Ser. No. 787,991

Int. Cl.² A01G *31/02*

U.S. Cl. 47—16 **12 Claims**



1. The method of growing legume sprouts which comprises:

a. providing a bed of seeds within a confined area of a growth chamber;

b. periodically introducing into said chamber a fine mist or fog of water above the seed bed, for a predetermined amount of time;

c. providing UV light in said growth chamber from the commencement of the germination cycle until the sprouts that germinate from seed are ready for harvest,

further including feeding the sprouts and seeds chelated minerals at least after each mist introduction has ceased wherein the feeding comprises impinging a solution of

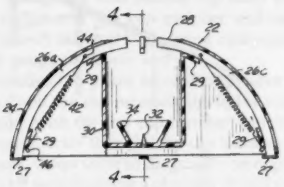
chelated minerals primarily upon the stems and leaves of the sprouts.

4,130,965

CHRISTMAS TREE HOLDER

Roy D. Patton, 221 Heritage Pl., Morresville, N.C. 28115, and Frank P. Rietveld, 1314 Vickie Ln., Matthews, N.C. 28105

Filed Sep. 2, 1977, Ser. No. 830,098
Int. Cl.[2] A47G *33/12*
U.S. Cl. 47—40.5 10 Claims



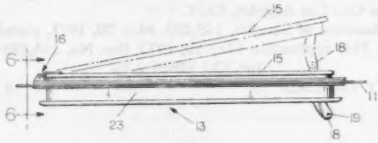
1. A holder for a Christmas tree or the like comprising a base of generally hemispherical configuration; an opening formed centrally in the upper surface of said base; a plurality of arcuate channels at least three in number symmetrically disposed around the periphery of the base; a like arcuate configuration gripping leg slidably mounted in each of said channels, protruding from the bottom of the base and freely movable therethrough toward and away from the opening, a central reservoir with its upper end in communication with said opening for receiving the trunk of the tree and for applying a downward force to the base to provide a sliding movement of the several legs through their respective channels into gripping relationship with said tree trunk.

4,130,966

VENTILATOR HATCH ASSEMBLY

Anthony Kujawa, Jr., and Frank J. Kujawa, both of Toledo, Ohio, assignors to Production Research, Inc., Toledo, Ohio

Filed Jan. 27, 1977, Ser. No. 762,863
Int. Cl.[2] B50G *7/08*
U.S. Cl. 49—141 20 Claims



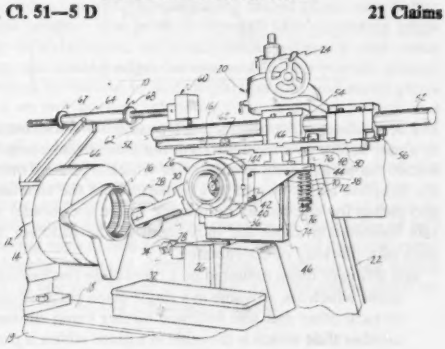
1. A ventilator hatch assembly for a hatch opening, comprising a frame member including a vertically disposed annular wall portion having a lower wall section and an upper wall section defining a central opening communicating with said hatch opening, said lower wall section being shaped to fit snugly within said hatch opening and said upper wall section providing a peripheral upstanding seat, a hatch member for said central opening, hinge means interconnecting adjacent edge portions of said hatch member and said frame member and accommodating hinged movements of said hatch member between alternative open and closed positions relative to said central opening, said open position of said hatch member being an inclined position overlying said hatch opening and intermediate said closed position and a fully opening position disposed in non-overlying relationship with said hatch opening, said hatch member defining an annular main frame possessing a generally T-shaped cross-sectional configuration defined by a laterally disposed annular upper rim and a depending wall section, said depending wall section being adapted to nest within said frame member and said annular upper rim being adapted to seat against said peripheral upstanding seat when said hatch member is in said closed position, said hinge means being disposed beneath the underside of said hatch opening and comprising a hinge pin carried by said depending wall section of said hatch member, said hinge pin having an axially elongated cylindrical shank portion projecting perpendicularly from said depending wall section towards said frame member, an elongated transverse pivot slot provided in said frame member and receiving said shank portion of said hinge pin therein, said pivot slot having a longitudinal axis disposed in normal relationship with said hatch opening to provide pivotal relative movements of the shank portion of said hinge pin within said pivot slot for accommodating hinged movements of said hatch member between said alternative open and closed positions, said pivot slot having a rim terminus providing a bearing surface firmly bearing against the shank portion of said hinge pin with sufficient force to urge the annular upper rim of said hatch member to firmly clamp against the peripherral upstanding seat of said frame member in tight sealing engagement, manually operable flip-action level means interconnecting said annular main frame of said hatch member and said frame member, said level means being responsive to manual manipulation to flip quickly between an alternative retracted position and an extended position corresponding to said closed and inclined open positions of said hatch member, said flip-action level means including fast response manual detachment means accommodating fast manual detachment of the interconnection thereof between said annular main frame of said hatch member and said frame member, whereby siad hatch member may be quickly positioned in a fully open non-overlying position relative to said hatch opening and thereby facilitate ingress and egress through said hatch opening.

4,130,967

PRECISION GEAR CROWN GRINDING MACHINE

Ray D. Easton, Madison Heights; Phil F. Jakobi, Grosse Pointe Woods, and Andrew L. Zabik, St. Clair Shores, all of Mich., assignors to BJR Machine & Gear, Madison Heights, Mich.

Filed Jun. 14, 1977, Ser. No. 806,357
Int. Cl.[2] B24B *53/06, 17/00*
U.S. Cl. 51—5 D 21 Claims



1. A gear crowning machine comprising:

a machine base;

a work holder means adapted to mount a gear therein, said work holder means including an indexing head intermittently rotating said gear mounted therein through an angular displacement corresponding to the gear tooth pitch;

a wheel head frame mounted on said machine base for relative displacement towards and away from said work holder means;

a pivotal fixture and means mounting said pivotal fixture on said wheel head frame for pivoting rotation about an axis orthogonal to said longitudinal axis of said work holder

means, said pivotal fixture including a first arm extending from said pivoting rotation axis and towards said work holder means;

a grinding wheel rotatably mounted on the free end of said first arm;

means for rotating said grinding wheel;

said pivotal fixture further including a second arm extending from said axis of pivotal rotation and cam actuation means drivingly engaging said second arm, said relative displacement of said work holder means and said wheel head frame causing constrained movement of said pivotal fixture to rotate about said means mounting said pivotal fixture on said wheel head frame;

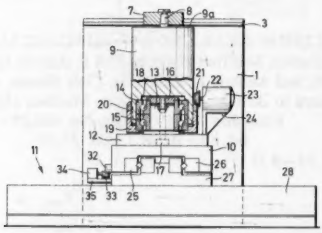
whereby said grinding wheel periphery may be moved through an arcuate path during said relative displacement of said wheel head by said rotation of said pivotal fixture.

4,130,968

MECHANISM FOR CONTROLLING MOVEMENTS OF A TOOL

Alois Vogelsang, Karl Anton Srasse 3, Dusseldorf, Germany (D-4000)

Filed Mar. 14, 1977, Ser. No. 777,046
Int. Cl.[2] B24B *17/00*
U.S. Cl. 51—100 R **8 Claims**



1. A mechanism for controlling movement of a tool mounted in a tool holder of a machine tool, the mechanism comprising a fixed template, a template follower which is pressed onto the the template and is housed at a distance from the tool holder, and means for electrically conveying to the tool holder separate information about the movement of the follower along each of a plurality of coordinates;

said follower being mounted on a cross-slide rest having two slides which are movable in a single plane perpendicularly to each other and said follower further being situated on another slide which is movable in a plane which is perpendicular to the first mentioned plane;

said tool holder being provided with a cross-slide rest having a plurality of slides which correspond to the slides of the cross-rest in which the follower is mounted, said tool holder slide being provided with a drive to enable the tool holder to perform movements, each of said tool holder slides being controllably coupled to a corresponding slide of the follower; and

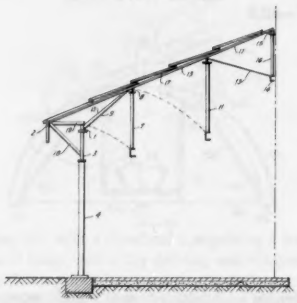
said controllable coupling being effected by a toothed rack, a pinion engaging the said rack, and an electrical distance measuring device operably connected to the pinion, associated with each slide, the electrical distance measuring devices of associated slides being connected to each other and to the drive of the associated slide of the tool holder.

4,130,969

HANGING PRESTRESSED ROOF STRUCTURE

Ivan B. Ivanov, Pazardjik, Bulgaria, assignor to DSO "Montaji" — Promishleno Montajno Upravlenie, Plovdiv, Bulgaria

Filed Dec. 10, 1976, Ser. No. 749,334
Claims priority, application Romania, Dec. 11, 1975, 31755
Int. Cl.[2] E04D *1/32*
U.S. Cl. 52—80 **4 Claims**



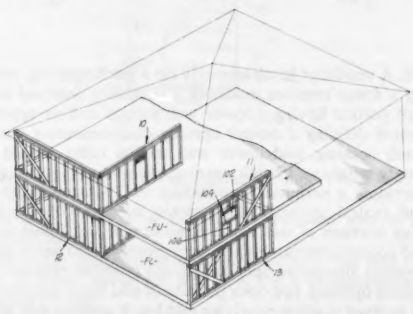
1. A hanging prestressed roof structure comprising a support ring spaced above the ground, a plurality of first cables forming a first cable net and spanning said ring along chords thereof said first cables having points of intersection spaced around the center of said ring, first posts secured at their bottoms to said first cables, a plurality of second cables spanning said ring along chords thereof forming a second cable net, said second cables being secured to the tops of said first posts, a plurality of second posts secured at their bottoms to said second cables, and an upright peak support connected at its top directly to said ring by further cables while being supported at its bottom from additional cables secured to the tops of at least some of said posts.

4,130,970

LOW COST HOUSING WALL STRUCTURE

Daniel K. Cable, Lakewood, Calif., assignor to Angeles Metal Trim Co., Los Angeles, Calif.

Continuation of Ser. No. 145,209, May 20, 1971, abandoned. This application May 29, 1973, Ser. No. 364,293
Int. Cl.[2] E04H *1/04*
U.S. Cl. 52—236.3 **4 Claims**



1. In a multiple story housing structure having an upper story and a lower story, the combination in which said lower story has a load-bearing wall structure comprising a series of load-bearing studs secured vertically between a cap member

and a floor track member, said studs being composed of steel of about 20 gauge thickness; and

said top story has a load-bearing top wall structure comprising:

an elongated normally horizontal top cap member adapted to overlie the top of a series of metal studs, said top cap member forming the top of the top wall structure;

an upwardly facing metal top floor track member adapted to receive the lower ends of a series of metal studs, said top floor track member forming the bottom of said top wall structure;

a series of upstanding load-bearing top studs secured vertically between said top cap member and said top floor track member, said top studs being composed of steel of about 26 gauge thickness; and

a pair of wooden top plates secured one above the other to the top of said top cap member, the lower top plate being coextensive with the top cap member and the upper top plate being shorter than the top cap member; and

a pair of metal straps secured diagonally on opposite sides of the top wall section across a plurality of said top studs; and

a stud secured vertically at one end of said top wall section between said top cap member and said top floor track member to provide a corner stud for said top wall section.

4,130,971

SET OF STRUCTURAL ELEMENTS FOR PRODUCING CUPBOARD WALLS AND OTHER WALL UNITS

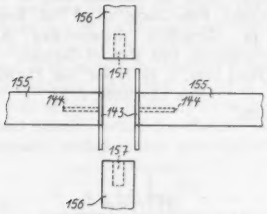
Willi Herrig, Konrad-Adenauer-Str. 16, 5450 Neuwied, Fed. Rep. of Germany

Filed Aug. 4, 1976, Ser. No. 711,484

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1975, 7524787[U]; Dec. 2, 1975, 2554113

Int. Cl.[2] A47B *57/00;* **F16B** *5/07;* **E04H** *1/00*

U.S. Cl. 52—236.7 **3 Claims**



2. A kit comprising structural component elements including panels having edges of equal length, first elements each having a groove in one edge, said groove extending less than the length of said edge so that it does not extend through adjoining edges, second elements each having a strip fixed along one edge, said strip being wider than the thickness of the element between its ends with the wider portion shorter than the length of said edge and equal to the length of the grooves in said first elements, said grooves being twice as wide as the thickness of said strips, so that a first element with a groove along one edge may receive the wider portions of two strips on two second elements to connect said elements, with said groove and wide portions of said strips being confined within the adjoining edges of the first element.

4,130,972

PANEL FOR SOUNDPROOF AND FIREPROOF INNER WALLS

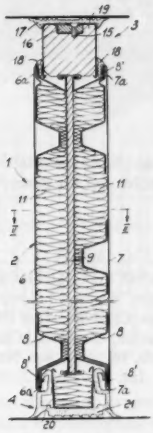
Giovanni Varlonga, Piazza della Repubblica, 7, Milano, Italy

Filed Jun. 13, 1977, Ser. No. 806,223

Claims priority, application Italy, Jun. 25, 1976, 24756 A/76

Int. Cl.[2] E04B *2/58, 1/62*

U.S. Cl. 52—241 **7 Claims**



1. A panel for soundproof and fireproof inner walls, of a type comprising two parallel reinforcing metal plates mechanically interconnected to form an interspace therebetween and a filler of insulating material, constituted essentially of rock-wool like material in said interspace characterized in that it comprises at least one continuous diaphragm extending parallel to said reinforcing metal plates arranged in an intermediate position and dividing said filler into parallel layers, said diaphragm comprising a plate of solid refractory material and having projecting edges projecting from said filler and having a rim, said reinforcing metal plates having folded edges constituting section member like portions thereof, said projecting edges being in engagement with said folded edges of said metal plates, said folded edges having each a first portion thereof extending transverse to said diaphragm and said metal plates and a second portion extending from said first portion and arranged parallel and in abutting relationship to said projecting edge of said diaphragm and a flange portion extending from said second portion transverse to said projecting edge of said diaphragm and arranged substantially flush with said rim, an insulator member covering said flange portion and a clamp member connecting said flange portions on both sides of said projecting edge of said diaphragm through said insulator member thereby to avoid thermal contact between said folded edges on one side of said diaphragm and said folded edges on the other side of said diaphragm member.

4,130,973

BUILDING BLOCK

Stig O. S. Gustavsson, Linkoping, Sweden, assignor to Curt Holger Ingeström, Alvangen, Sweden

Filed Sep. 7, 1977, Ser. No. 831,184

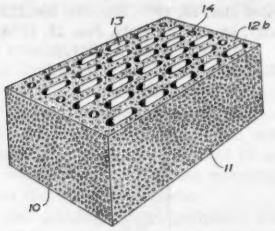
Int. Cl.[2] E04C *1/40, 1/06*

U.S. Cl. 52—309.17 **4 Claims**

1. An improved heat-insulated building block comprising:

a parallelepipedic body of cement-stabilized elastic granulate, said granulate being of a predetermined grade range for forming interstices, and wherein blind holes are formed extending into said body perpendicular from a surface thereof which is intended to be the lower side of the building block when in operative position, said holes

being arranged in several rows each of which comprises a plurality of spaced holes; and



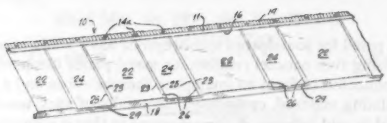
heat-insulating foam plastic material injected into said holes for filling said holes and for penetration into said formed interstices.

4,130,974

SIDING PANELS AND THE METHOD OF PRODUCTION

Alexander A. Chalmers, Warren; J. Lynn Gailey, Newton Falls, and Carl A. Wollam, Cortland, all of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Filed Feb. 16, 1977, Ser. No. 769,342
Int. Cl.[2] E04D *3/30*
U.S. Cl. 52—531 **15 Claims**



8. A horizontally elongated ductile sheet siding panel having a major surface configuration simulating a row of wooden shingles, said panel including

(a) a longitudinal upper margin attachable to a wall in substantially flush relation thereto;

(b) a longitudinal lower margin bent inwardly to constitute a flange for supporting the lower part of the panel in outwardly spaced relation to a wall when said upper margin is attached to the wall; and

(c) a continuous web extending between the upper and lower margins over the full horizontal length of the panel and sloping downwardly and outwardly from said upper margin to said lower margin, said web having an outwardly facing major surface;

wherein the improvement comprises:

(d) said web comprising a plurality of raised shingle-simulating portions and a plurality of depressed shingle-simulating portions disposed in alternating relation along the length of the web, said raised and depressed portions having extended surfaces respectively lying in spaced parallel planes, each of said raised and depressed portions extending upwardly from the lower margin of the panel across substantially the full width of the panel, adjacent ones of said raised and depressed portions each being of sufficient width to simulate adjacent wooden shingles; and

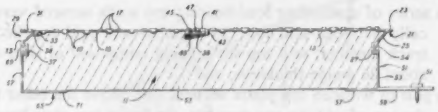
(e) said web further comprising narrow, vertically oriented web portions extending obliquely between adjacent raised and depressed portions, each of said obliquely extending portions having a surface with a slope, relative to the surface planes of the raised and depressed portions, that increases progressively in an upward direction, and each of said obliquely extending portions tapering upwardly as viewed in projection in a plane parallel to the surface planes of the raised and depressed portions for producing an appearance of downward divergence of the surface planes of the adjacent raised and depressed portions respectively lying on opposite sides thereof.

4,130,975

INSULATION PANEL

Jay R. Kelley, 2045 Etowah St., Tarrant, Ala. 35217

Filed May 16, 1977, Ser. No. 797,236
Int. Cl.[2] E04C *1/10, 1/30*
U.S. Cl. 52—588 **13 Claims**



1. An insulation panel comprising:

(a) a first elongated extruded aluminum plate of a first width;

(b) a second extruded aluminum plate of equal length and second width;

(c) a channel formed at one longitudinal end of one of said plates, said channel being formed by a member extending from said panel and having a short portion extending inwardly essentially perpendicular to said panel at a distance from said one longitudinal end thereof, a portion extending from said perpendicular portion essentially parallel to the plane of said panel beyond said one longitudinal end thereof, the end of said portion bent in a radius to form a partially closed channel; and

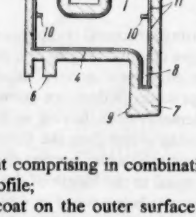
(d) a matching projection at one longitudinal end of the other of said plates, said projection including a portion projecting inwardly essentially perpendicular to said other plate disposed at the longitudinal end of said plate and a second portion extending in both directions from said perpendicular portion essentially parallel to said plate so that when assembled said matching projection fills said channel and permits said channel to be pressed tightly about said projection, such that said plates are in abutting relationship over their length to thereby form a panel.

4,130,976

FRAME FOR DOORS, WINDOWS AND THE LIKE

Helmut Kesseler; Gerd L. Anstadt, both of Pirmasens, and Hermann Kiefer, Petersberg, all of Fed. Rep. of Germany, assignors to Gerbrüder Kömmerling Kunststoffwerke G.m.b.H., Pirmasens, Fed. Rep. of Germany

Filed Mar. 7, 1977, Ser. No. 774,690
Int. Cl.[2] E04C *2/22*
U.S. Cl. 52—656 **18 Claims**



1. A frame element comprising in combination:

a hollow metal profile;

a synthetic resin coat on the outer surface of said hollow metal profile and having both a densified outer skin facing outwardly away from said hollow metal profile and a foamed portion having an expanded and cellular texture under said outer skin; and

means for bonding said hollow metal profile to said synthetic

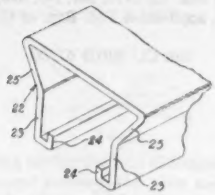
resin coat and for transmitting shearing load between the same.

4,130,977

CONCRETE INSERT

William E. Taylor, Jr., Ridgewood, and Artin P. Moughalian, Highland Park, both of N.J., assignors to Versabar Corporation, Paterson, N.J.

Filed Jan. 10, 1977, Ser. No. 757,787
Int. Cl.[2] E04B 1/38
U.S. Cl. 52—710 3 Claims



1. A concrete insert, free from hooks, for anchoring and supporting anchor nuts for retaining various brackets and fittings such as used in a metal framing system with the insert embedded in concrete for its full depth and for either part or all of its entire length, said insert comprising:

an elongated metal channel member of uniform thickness having a flat back wall and side edges, the back wall extending for substantially the entire length of the insert, the uniform thickness of the channel member providing uniformity of load stress along the entire length of said channel member;

a pair of side walls integrally connected to the side edges of the back wall and projecting forwardly an equal distance to the front face of the channel member and terminating in flanges projecting towards each other formed parallel to and spaced from the back wall, said flanges being formed with lips projecting inwardly towards said back wall for supporting a loaded anchor nut without exerting a spreading stress on the channel side walls; and

said channel side walls being formed with two longitudinally extending half sections with the outer half sections being parallel to each other so that when the channel member is embedded in concrete with loaded anchor nuts supported therein no wedging stress is exerted on the concrete adjacent the open face of the channel, and with the inner half sections of the side walls flaring outwardly in the form of a wedge so as to anchor the channel member when embedded in concrete and so that any stress exerted on the concrete will be spaced inwardly from the front face of the channel member when the channel member is thus embedded with loaded anchor nuts supported therein.

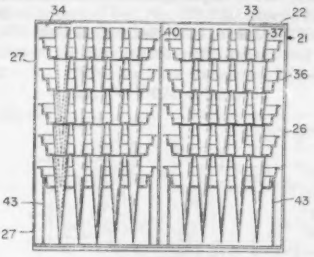
4,130,978

METHOD OF ASSEMBLING DISPOSABLE PIPETTE TIPS FOR SHIPMENT TO USERS THEREOF

Jules B. Cohen, Bayside, N.Y., assignor to Medical Laboratory Automation, Inc., Mount Vernon, N.Y.

Continuation of Ser. No. 631,185, Nov. 12, 1975, abandoned, which is a division of Ser. No. 154,143, Jun. 17, 1971, Pat. No. 3,937,322. This application Feb. 25, 1977, Ser. No. 772,312
Int. Cl.[2] B65B 5/10
U.S. Cl. 53—444 1 Claim

1. The method of assembling disposable pipette tips in a multi-layered package from which a user can mount a tip on a pipette without manual handling of the tip, which method comprises the steps of providing a plurality of tips of the type having a generally conical shape with abutment means on the exterior surface of the tip, providing a first tray having a plurality of apertures therein each of which has a diameter slightly greater than the diameter of a tip at a point immediately below the tip abutment means, placing a plurality of pipette tips on said first tray so that each pipette tip is supported on the tray only by the tip abutment means and projects loosely through an aperture of the tray, providing support means having a height greater than the length of that portion of a disposable tip projecting through said first tray to support the periphery of said first tray so that a user of said tips can insert a pipette into a tip and apply a downward force on the pipette so as to wedge the tip onto the pipette without wedging the tip into the aperture through which it projects whereby the tip is secured to the pipette and by lifting the pipette can be removed from the tray, providing a second tray similar to said first tray with a plurality of pipette tips each supported thereon only by the tip abutment



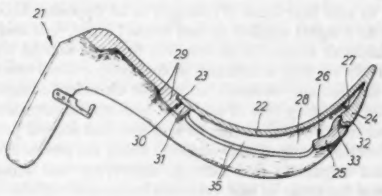
means so that a portion of each tip projects loosely through an aperture of said second tray, placing said second tray of pipette tips atop said first tray of pipette tips such that said second tray is supported by the pipette tips supported by said first tray and the pipette tips supported by said second tray project loosely into the pipette tips supported by said first tray whereby the pipette tips supported on said second tray can be removed from said second tray by inserting a pipette into the tip and applying a downward force on the pipette so as to wedge the tip onto the pipette without wedging the tip into the aperture through which it projects or into the tip into which it loosely projects, and providing means to retain said tips in their trays during shipment.

4,130,979

SADDLE TREE FOR RIDING SADDLES

Lorenz Bischeltsrieder, Fürstenfeldbruck, Germany, assignor to Stübben GmbH, Riding Equipment, Stans, Switzerland

Continuation-in-part of Ser. No. 555,194, Mar. 4, 1975, Pat. No. 4,004,402. This application Jan. 21, 1977, Ser. No. 761,010
Int. Cl.[2] B68C 1/00
U.S. Cl. 54—44 8 Claims



1. A saddle tree which comprises a rigid, front saddle tree member having a neck with points depending therefrom, a waist extending rearwardly from said neck, and mounting means adapted to receive cantles of different lengths and widths so that saddle trees of different sizes can be made using identical front saddle tree members, said mounting means comprising a recess in the upper surface of said front saddle tree member for locating a cantle relative to said front saddle tree member; a separate cantle member seated in said recess, said cantle member having a lower surface portion configured

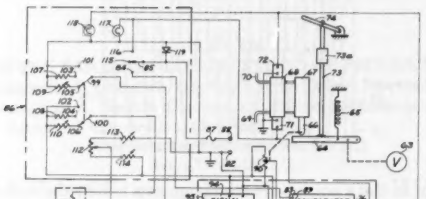
to match said recess and thereby position said cantle member relative to said front saddle member; and means fixing said cantle member to said front saddle tree member, said cantle member being of thin-wall configuration and fabricated of a resilient material and, further, being fixed only at the front and rear portions thereof to said rigid, front saddle tree member and otherwise being spaced from said front saddle tree member so that it can elastically yield in a downward direction into the space between it and said rigid, front saddle tree member.

4,130,980

COMBINE AUTOMATIC TRAVEL CONTROL SYSTEM

Randolph G. Fardal, Westmont, and Calvin P. Rickerd, La Grange Park, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Jan. 6, 1977, Ser. No. 757,406
Int. Cl.² A01D *41/02*
U.S. Cl. 56—10.2 **22 Claims**



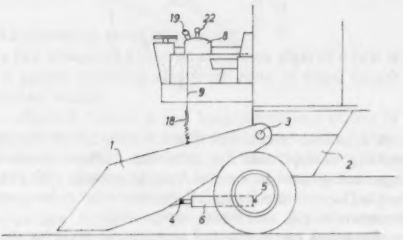
1. A control system for a combine including an engine, drive wheels, a transmission for driving said drive wheels from said engine, said transmission having a variable drive ratio, crop cutting, conveying and separator means, and means for driving said crop cutting, conveying and separator means from said engine, said control system comprising: a movable control element for controlling said variable drive ratio of said transmission to control the speed of travel of the combine, electrically controllable actuator means for said control element, a comparator circuit including amplifier means for controlling said actuator means, said comparator circuit having first and second inputs and being operative through said actuator means, control element and transmission to cause the forward speed of travel of the combine to be reduced when a signal applied to said first input is changed in one direction relative to a signal applied to said second input and to cause the forward speed of travel of the combine to be increased when a signal applied to said first input is changed in an opposite direction relative to a signal applied to said second input, first and second transducer means for developing first and second signals respectively varying as first and second proportional functions of first and second variables, adjustable electrical component means for adjusting one of said first and second proportional functions relative to the other of said first and second proportional functions, one of said variables being the power applied from said engine to said cutting, conveying and separator means and the other of said variables being said variable drive ratio of said transmission, and means for applying said first and second signals from said first and second transducer means to said first and second inputs of said comparator circuit with said first and second signals being applied in directions as to be brought into balanced relationship when the position of said control element and the corresponding speed of travel of the combine correspond to the power applied from said engine to said cutting, conveying and separator means in accordance with a certain function determined by the relation between said first and second proportional functions, said comparator circuit being operative through said actuator means, control element and transmission to cause operation of the combine at a uniform forward speed when said first and second signals are in said balanced relationship and being operative through said actuator means to change the position of said control element in response to a substantial change in the power applied from said engine to said cutting, conveying and separator means.

4,130,981

CONTROL SYSTEM AND METHOD FOR COMBINE HARVESTERS

Gustav Schumacher, II, and Gunter Schumacher, both of 5231 Eichelhardt, Westerwald, Fed. Rep. of Germany

Filed Jun. 22, 1976, Ser. No. 698,762
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1975, 2529160
Int. Cl.² A01D *67/00*
U.S. Cl. 56—208 **18 Claims**



1. In a harvester, such as a combine harvester, a chassis, a cutter mechanism carried by said chassis to be raised and lowered with respect thereto so as to have its elevation with respect to the ground regulated, and hydraulic means connected between said chassis and cutter mechanism for raising and lowering the latter, a control system for controlling the raising and lowering of the cutter mechanism, said control system comprising a pair of series-connected spring means and a cable operatively connected thereto, said spring means and cable connecting said cutter mechanism to said chassis, and manually operable lever means operatively connected with at least one of said spring means for controlling the force thereof, raise valve means and lower valve means operatively connected with said hydraulic means for controlling the latter to raise or lower the cutter mechanism, and switch means connected between said pair of spring means and operatively connected with said raise or lower valve means for actuating one or the other thereof for bringing about raising or lowering of the cutter mechanism, said switch means also having a neutral position where neither of said valve means is actuated, said lever means being operatively connected with said chassis for movement with respect thereto and both of said spring means being operatively connected through said cable with said lever means to be adjusted

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4,130,982

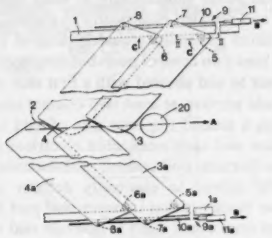
FRUIT HARVESTING MACHINE

Roger Clary, Loudun, France, assignor to Howard Machinery Limited, Bury St. Edmunds, England

Filed May 16, 1977, Ser. No. 796,988
Claims priority, application France, May 19, 1976, 76 15106
Int. Cl.² A01D *46/00*
U.S. Cl. 56—330 **5 Claims**

1. A fruit harvesting machine comprising a mobile frame including longitudinal frame members located symmetrically and to either side of the central longtiudinal axis of the frame, two groups of base plate members each group extending from one of the frame members towards said axis and each plate member being pivotally attached at one end to a frame member so that the free end is movable away from said axis, and resilient pivot means for each plate member biasing the free ends of the plate members towards said axis, the resilient pivot means

being in the form of an external sleeve fixed to the associated frame member, an internal sleeve attached to said one end of each plate member, and a resilient sleeve between the internal and external sleeves and pre-stressed to urge the internal sleeve to rotate relative to the external sleeve, the plate members



forming a receiving surface for fruit dislodged by the machine, and the arrangement enabling the plate members to be displaced to allow the passage of fruit bearing plants or bushes between the frame members during forward movement of the machine.

4,130,983

YARN SPINNING APPARATUS AND PROCESS

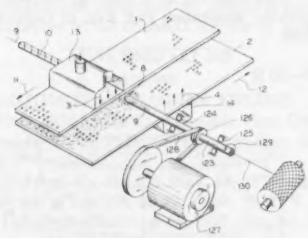
Peter Dammann; Heinz Schippers; Herbert Turk, all of Remscheid, and Herbert Schiminski, Huckeswagen, all of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Germany

Filed Mar. 28, 1977, Ser. No. 782,310

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1976, 2613263

Int. Cl.[2] D01H *1/12;* D02G *3/36, 3/38*

U.S. Cl. 57—5 **54 Claims**



1. A process for spinning fibers to form a yarn which comprises rotating a body of discrete fibers in a yarn forming zone in a space between two adjacent air permeable surfaces moving in substantially opposite directions across the yarn forming zone, while passing respective currents of air through different segments of said space separated by and on opposite sides of the yarn being formed in said yarn forming zone, the respective currents of air flowing through said space in substantially opposite directions with the vectors of movement of said moving surfaces and the vectors of movement of said currents of air respectively on said opposite sides of the yarn being formed and being the same as the direction of rotation of the yarn which is being formed and also collectively encircling said yarn which is being formed.

13. Apparatus for production of yarns from discrete fibers which comprises two, spaced, air permeable surfaces moving in opposite directions on opposite sides of a yarn producing zone situated in a narrow space between said surfaces, first and second air suction means each respectively embodying an air entry opening extending longitudinally adjacent said yarn producing zone on the respective sides of said moving surfaces which are remote from said zone for drawing respective currents of air through said moving surfaces, each of said air entry openings being positioned relative to said yarn producing zone to draw substantially all of its current of air through its respective moving surface in the area thereof immediately preceding the yarn producing zone, as viewed in the direction of movement of its respective moving surface, and feed means for feeding discrete fibers between said surfaces in the vicinity of said yarn forming zone.

4,130,984

METHOD AND APPARATUS FOR MAKING NOVELTY YARN

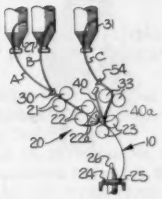
John W. Lambert, Jr., Spartanburg, S.C., assignor to Tuscarora Cotton Mill, Mount Pleasant, N.C.

Continuation-in-part of Ser. No. 629,019, Nov. 5, 1975, Pat. No. 4,041,690. This application Jul. 5, 1977, Ser. No. 812,784

The portion of the term of this patent subsequent to Aug. 16, 1994, has been disclaimed.

Int. Cl.[2] D02G *3/34, 3/36*

U.S. Cl. 57—12 **22 Claims**



1. A method of making a novelty yarn, having relatively short varying length and varying size auxiliary strands randomly distributed therealong, on a spinning frame having a series of spaced pairs of rotatable drafting elements defining a drafting zone and wherein the pairs of drafting elements include a pair of delivery rolls, said method comprising advancing at least one strand of staple fibers into and through the drafting zone while continuously forming therefrom a ground strand of drafted staple fibers emerging from the delivery rolls, feeding an auxiliary strand of staple fibers through the nip of a pair of auxiliary feed rolls and to the nip of the delivery rolls, while rotating the auxiliary feed rolls at a slower effective speed than the effective speed of the delivery rolls so as to effect a random parting of the auxiliary strand and thereby form relatively short varying length auxiliary strands randomly distributed along the ground strand, while also shielding the auxiliary strand from contacting the rotatable drafting elements immediately behind the delivery rolls during the travel of the auxiliary strand to the delivery rolls to thereby prevent the auxiliary strand from being misdirected rearwardly away from the delivery rolls, and twisting the ground strand and the randomly distributed auxiliary strands as they emerge from the delivery rolls to arrange the auxiliary strands spirally around the ground strand and form a novelty yarn therefrom.

11. In a spinning frame for making novelty yarn and having means defining a drafting zone for drafting therethrough at least one strand of staple fibers to form a ground strand therefrom, said means comprising a series of spaced pairs of rotatable drafting elements including a pair of driven cooperating delivery rolls, and twisting means cooperating with said drafting elements for imparting twist to the ground strand as it emerges from said delivery rolls; the combination therewith of a pair of auxiliary feed rolls adjacent said delivery rolls and being adapted to feed an auxiliary strand of staple fibers to the nip of the delivery rolls, means for driving said auxiliary feed rolls at a slower effective speed than the effective speed of said delivery rolls such as to effect a random pulling apart of the auxiliary strand in its travel between the auxiliary feed rolls and the delivery rolls and to thereby form relatively short varying length auxiliary strands for being distributed along the ground strand and spirally twisted around the ground strand by said twisting means for making the novelty yarn therefrom,

and shielding means adjacent said drafting zone and being so positioned as to shield the auxiliary strand from contacting the rotating drafting elements immediately behind the delivery rolls during the travel of the auxiliary strand to the delivery rolls to prevent the auxiliary strand from being misdirected rearwardly away from the delivery rolls.

4,130,985

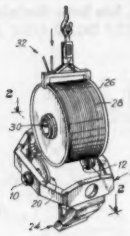
REEL CARRYING SYSTEM FAIL-SAFE LOCKING DEVICE

Joseph A. Varga, Toronto, Canada, assignor to Ceeco Machinery Manufacturing Limited, Concord, Canada

Continuation-in-part of Ser. No. 774,587, Mar. 7, 1977, Pat. No. 4,079,580. This application Feb. 16, 1978, Ser. No. 878,339

Int. Cl.[2] D07B *7/06, 3/02*

U.S. Cl. 57—127.5 **53 Claims**



1. A fail-safe locking device for reel-carrying systems, comprising an actuatable member mounted on a support member for slidable movement relative thereto along an axis; reel engaging means mounted on said actuatable member for sharing the axial movements thereof between reel engaging and disengaging positions; biasing means for urging said actuatable member to one of said positions; locking means cooperating with the support member and movable between locking and releasing positions for permitting movement of said actuatable member from said one to another of said positions only in the releasing position of said locking means; and fluid pressure means for moving said locking means to said releasing position only upon application of fluid medium under pressure with attendant movement of said actuatable member to said other of said positions, said locking means being arranged to directly cooperate and block the movement of said actuatable member to the other of said positions in the locking position of said locking means to thereby provide fail-safe operation during reel engagement independently of the fluid medium pressure provided by said fluid pressure means.

4,130,986

ELECTRONIC WATCH, ESPECIALLY ELECTRO-OPTIC DISPLAY WATCH

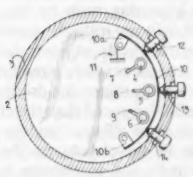
Gilbert Ramet, Cheseaux-Noreaz, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Jun. 22, 1977, Ser. No. 808,918

Claims priority, application Switzerland, Jul. 8, 1976, 8760/76

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **3 Claims**



1. An electronic watch of the type having an electro-optic display and several control functions, each function adapted to be activated upon coupling a corresponding control circuit to ground, said watch comprising:

a case including a frame for a movement and at least one wall, a resilient contact blade and means for mechanically securing said blade substantially at each end thereof to said frame and coupled electrically to ground, to provide an unrestrained generally arcuately shaped intermediate portion, at least two control push-buttons mounted on said wall adjacent to and abutted with a first side of said intermediate blade portion, at least two contact studs mounted spaced from a second opposite side of said intermediate blade portion and each connected electrically to respective control circuits, said control push-buttons adapted to be manually moved to elastically deform part of said intermediate blade portion to move said part into contact with at least one of said studs to activate said corresponding control circuit while a second part of said intermediate blade portion is elastically deformed away from said studs.

4,130,987

TIMEPIECE

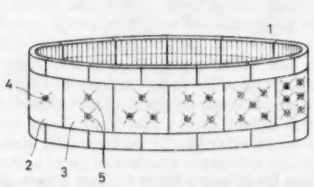
Willi Schickedanz, Langener Strasse 70, 605 Offenbach am Main, Fed. Rep. of Germany

Filed May 26, 1976, Ser. No. 689,645

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1975, 2525694

Int. Cl.[2] G04B *19/34*

U.S. Cl. 58—50 R **28 Claims**



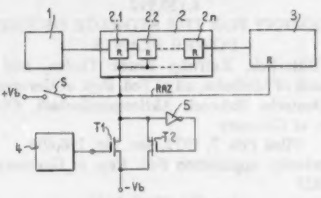
1. A timepiece comprising means for generating time standards, including an oscillator for producing a high frequency time standard signal; means for converting said time standards into different time unit pulses, including a pulse shaping device and circuit means for dividing said high frequency time standard signal into different time unit pulses; and time displaying means connected to said converting means and being capable of changing their light emitting states in correspondence to said time unit pulses; a plurality of shift registers connected to the time displaying means, said circuit means being connected to one out of said plurality of shift registers, whereby during the supply of one of said time displaying means those time displaying means which had been supplied before are switched off, and further including an AND-gate connected between a shift element of one of said plurality of shift registers and the corresponding time displaying means, the first input of said AND-gate being connected to the output of said shift element and the second input of said AND-gate being connected to the output of the following shift element via an inverting gate.

4,130,988

ELECTRONIC CIRCUIT FOR ELECTRONIC WATCH

Igor Scherrer, Colombier; Jean-Claude Berney, Lausanne, and Jean-Claude Robert-Grandpierre, Colombier, all of Switzerland, assignors to Ebauches S.A., Neuchatel, Switzerland

Filed May 17, 1977, Ser. No. 797,681
Claims priority, application Switzerland, May 25, 1976, 6559/76; Mar. 22, 1977, 3561/77
Int. Cl.[2] G04C 17/00
U.S. Cl. 58—85.5 6 Claims



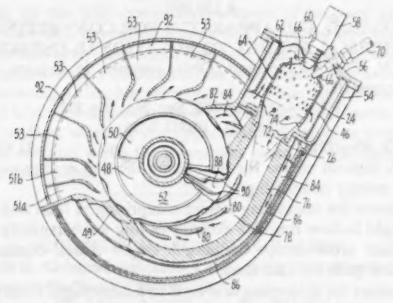
1. In an electronic watch having a power supply means, a quartz oscillator, frequency divider means comprising flip-flops, and display means for displaying time information, at least some of the said flip-flops being connected to a common line and arranged in such a way that a signal applied to said common line places said flip-flops in a predetermined state, the improvement comprising a circuit for permitting stopping of said watch in a state of minimum consumption including a switch means, one of the terminals of which is connected to a first terminal of the supply and the other terminal to the common line, and first and second MOS transistors having their sources connected to the second supply terminal and their drains to the common line, the gate of the first of these transistors being connected to means for enabling it to be conducting at least periodically, and the gate of the second of these transistors being connected to the common line via an inverter.

4,130,989

AUTOMOTIVE TURBINE ENGINE

Richard E. Wirth, 1574 Melba Ct., Mountain View, Calif. 94040, and Manfred N. Wirth, 1021 Heatherstone Way, Sunnyvale, Calif. 94087

Continuation of Ser. No. 415,331, Nov. 13, 1973, abandoned, which is a division of Ser. No. 90,192, Nov. 19, 1970, Pat. No. 3,771,312. This application Aug. 31, 1977, Ser. No. 829,258
Int. Cl.[2] F02C 7/00, 7/08
U.S. Cl. 60—39.52 1 Claim



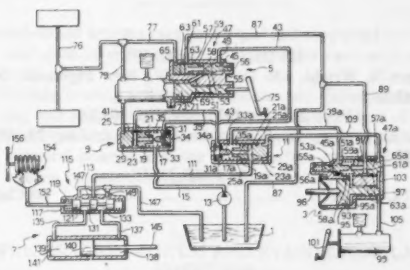
1. In a gas turbine, the combination of
(a) a mixing wheel comprising a radial flow centrifugal impeller;
(b) a combustion chamber adjacent the periphery of said mixing wheel.
(c) said mixing wheel having an annular inlet on one face thereof to receive compressed air,
(d) means including a first fixed opening controlling said annular inlet to admit compressed air to the mixing wheel for only a first arcuate portion of the wheel's rotational travel.
(e) means including a second fixed opening for communicating the exhaust of said combustion chamber with the periphery of said mixing wheel for only a second arcuate portion of the wheel's rotational travel so as to conduct the gases from the combustion chamber to said mixing wheel,
(f) means closing off said annular inlet and the periphery of said mixing wheel for only a third arcuate portion of the wheel's rotational travel wherein said compressed air and combustion gases are mixed in the mixing wheel under constant volume, and
(g) mixture exit means occupying only a forth arcuate portion of the wheel's rotational travel.

4,130,990

HYDRAULIC SYSTEM FOR FEEDING A PLURALITY OF INDEPENDENT HYDRAULIC SERVO-OPERATED DEVICES

Giuseppe Amedei; Enrico Rivetti, both of Turin, and Antonino Bertone, Sant'Antonino, all of Italy, assignors to FIAT Societa per Azioni, Turin, Italy

Filed Jul. 15, 1977, Ser. No. 816,070
Claims priority, application Italy, Jul. 20, 1976, 68810 A/76
Int. Cl.[2] F16D 31/00
U.S. Cl. 60—422 2 Claims



1. In a hydraulic system for feeding a plurality of independent hydraulic servo-operated devices, of the type comprising:
a volumetric pump,
a reservoir of hydraulic fluid,
first and second distributor devices, one associated with a servo-operated brake actuator and the other associated with a servo-operated clutch actuator, and each having a control chamber separated by a valve shutter from a pressure distribution chamber,
a third distributor device associated with a servo-operated steering actuator and having an outlet connected to said reservoir, which outlet is open when said steering servo is not operating,
the improvement comprising:
first and second modulating valves for directing hydraulic fluid from said volumetric pump to said first, second and third distributor devices, each of said first and second modulating valves comprising:
a cylinder,
a piston within said cylinder separating it into first and second chambers,
means defining a transverse passageway in said piston,
means defining an axial passageway in said piston communicating at one end with said first chamber of the modulating valve and at the other end with said transverse passageway in said piston,

means defining an opening in the cylinder wall, said transverse passageway in said piston communicating, in all positions of said piston with said opening,

two sealing rings on said piston sealing said transverse passageway in said piston from said first and second chambers of said cylinder, and

a valve shutter element resiliently mounted in said first chamber of said modulating valve and cooperating with the mouth of said axial passageway of said piston whereby to restrict the flow of fluid through said axial passage when said piston is displaced towards said valve element without completely closing said axial passage,

first conduit means connecting said first chamber of said first modulating valve to said volumetric pump,

second conduit means connecting said first chamber of said first modulating valve to said control chamber of said first distributor device,

third conduit means connecting said first chamber of said second modulating valve to said control chamber of said second distributor device,

fourth conduit means communicating with said transverse passage in said piston of said first modulating valve being connected to said first chamber of said second modulating valve,

fifth conduit means communicating with said transverse passageway in said piston of said second modulating valve being connected to said third distributor device,

sixth conduit means connecting said second chamber of said first modulating valve to the servo actuator associated with said first distributor, and

seventh conduit means connecting said second chamber of said second modulating valve to the servo actuator associated with said second distributor.

4,130,991
HYDRAULIC PUMPS

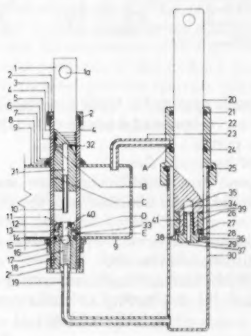
Howard S. Wright, 436 Devon St. W., New Plymouth, New Zealand

Filed Jun. 23, 1977, Ser. No. 809,164

Claims priority, application New Zealand, Jun. 23, 1976, 181253

Int. Cl.[2] F15B *15/18*

U.S. Cl. 60—477 **20 Claims**



1. A hydraulic pump comprising:

a plunger slidingly located within a housing;

a reservoir;

first valve means located between said reservoir and housing and adapted to allow fluid to be drawn from the reservoir into the housing during movement of the plunger in one direction;

second valve means adapted to allow fluid to flow from the housing during the greater part of movement of the plunger in its other direction;

control means to open or retain open said second valve means when the plunger is near the completion of movement in said other direction and thus allow fluid to reverse flow through said second valve and into said housing;

a port in said housing which is in communication with said reservoir;

conduit means to direct said reverse flow to said port; and

regulating means to gradually increase the rate of said reverse flow through said port as the plunger is moved toward commpletion of its movement in said other direction.

4,130,992
ARRANGEMENT FOR THE STORAGE OF ENERGY IN POWER PLANTS

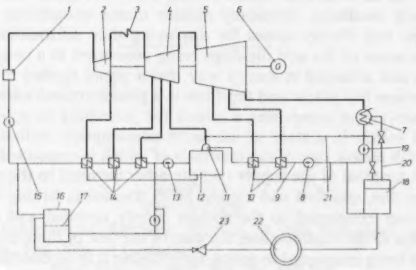
Eberhard Bitterlich, Kettwig; Franz Thelen, and Henning Weber, both of Mulheim, all of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Feb. 7, 1977, Ser. No. 766,606

Claims priority, application Fed. Rep. of Germany, May 6, 1976, 2620023

Int. Cl.[2] F01K *3/12*

U.S. Cl. 60—652 **12 Claims**



1. A method for the storage of energy in power plants comprising the steps of: heating an excess of water during low-load operation in water preheaters; storing the heated water as hot water in a hot storage vessel; feeding the heated water from said storage vessel during peak-load operation into a feed water line and bypassing said feed water preheaters; alternately taking from and storing in a lower portion of said storage vessel cold water and said hot water; degassing thermally said cold water before storing in said storage vessel, said degassing step being applied with bleeder steam at a pressure substantially above atmospheric.

4,130,993
METHOD AND APPARATUS FOR CONVERTING THERMAL ENERGY TO ROTATIONAL ENERGY

Julio N. Erazo, Cincinnati, Ohio, assignor to Ectrice, Ltd., Chicago, Ill.

Filed Apr. 11, 1977, Ser. No. 786,231

Int. Cl.[2] F03G *7/06*

U.S. Cl. 60—721 **21 Claims**

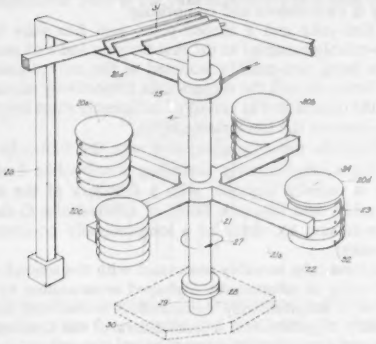
1. A thermal engine for converting thermal energy to rotational energy comprising:

a. means for containing a fluid comprising at least one fluid tight hollow ring-like conduit having a substantially constant cross-section defining a single closed continuous flow path for said fluid;

b. means for subjecting said fluid to a centrifugal force field, said subjecting means comprising support means having a central shaft for rotating said conduit about said shaft in a plane substantially parallel to said flow path, said support means mounting said conduit so as to prevent relative movement therebetween; and

c. means for impressing a thermal gradient across said fluid,

whereby a density gradient is produced in said fluid which is acted upon by said centrifugal force field to produce a



moment about said rotational axis by which rotational energy is transmitted to said shaft.

4,130,994

ARTIFICIAL REEF TO PREVENT SHORELINE EROSION

John H. Van Moss, Jr., 3 Mavor La., Highland Park, Ill. 60035

Filed May 27, 1977, Ser. No. 801,049
Int. Cl.[2] E02B *3/00*
U.S. Cl. 405—24 **5 Claims**

1. A grid for controlling shoreline erosion by controlling the water movement throughout the full water column each part making up the grid comprising a series of buoyant curved disks, each disk having an arcuate body with the free margins bent downwardly in a taper, and said disk provided with an axial hollow hub, a flexible line on which said disks are spacedly secured, an anchor, one end of said line tethered to said anchor while the uppermost disk on the line is positioned at the water surface, whereby the uppermost disks tend to break up surface currents while the lowermost disks are responsive to the bottom currents.

4,130,995

VMP RISER HORIZONTAL BEARING

Bodwell D. Osborne, Atherton, Calif., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 3, 1977, Ser. No. 848,047
Int. Cl.[2] B63B *35/44*
U.S. Cl. 405—224 **3 Claims**

1. A structure for use with a buoyant structure which comprises:

a shell;

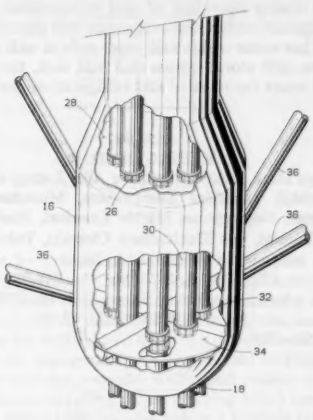
an upper plate in said shell;

a lower plate in said shell, each plate having a plurality of vertical holes therethrough;

riser pipes extending through said holes through each said plate;

bearing means supported in each said vertical hole between each said riser pipe and said plate, said bearing means including

a male spherical bearing surrounding said riser pipe, the center of the sphere defined by the outer surface of said spherical bearing being on the center line of said riser;



a cylindrical bearing surface formed and supported by each said plate in said opening at the level of each said plate; and

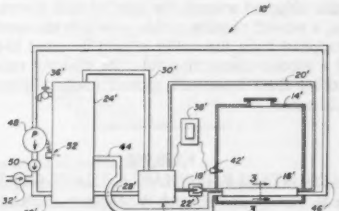
a floating bearing positioned between said cylindrical bearing and said spherical bearing, the inner surface of said floating bearing complementing the outer surface of said spherical bearing and the outer surface of said floating bearing complementing said cylindrical surface.

4,130,996

REFRIGERATION SYSTEM AND EVAPORATOR UNIT THEREFOR

Gratz M. Sult, Box 164, Poplar St., Intercourse, Pa. 17534

Filed Jun. 6, 1977, Ser. No. 803,430
Int. Cl.[2] F25B *39/04, 41/00*
U.S. Cl. 62—113 **8 Claims**



1. An improved refrigeration system for cooling milk in a dairy operation comprising:

(a) a bulk-milk cooler tank for storage of the milk;

(b) an evaporator unit disposed within said milk storage tank and in contact with said milk stored therein;

(c) a water-cooled condenser unit including a refrigerant compressor and condenser coils operably interconnected with said evaporator unit for cooling the milk within said storage tank;

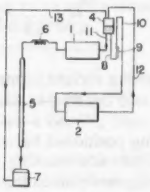
(d) means for supplying water to said condenser unit and circulating said water over and around said condensation coils during operation of said refrigeration system to cool and thereby condense the refrigerant carried by said coils; and

(e) means for cooling the hot water generated by said water-cooled condenser unit during operation of said refrigeration system, said cooling means being interconnected between said water supply means and said evaporator unit, said cooling means includes water conduit coils in heat transfer relationship with said evaporator unit such that during operation of said refrigeration system, the refrigerant within said evaporator unit absorbs the heat of said hot water within said water coils as well as the heat of warm milk stored within said bulk tank, thereby cooling said water for reuse in said refrigeration system.

4,130,997
REFRIGERATOR

Toshitsugu Hara, Tokyo; Yoritsune Abe; Katsuji Ootuka, both of Tochigi; Yasushige Kashiwabara, Musashino; Hiroichi Oshiyama, Nagareyama; Michio Yanadori, Hachioji; Eisaku Kato, Tochigi, and Kichizaemon Okazaki, Yokohama, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 8, 1976, Ser. No. 748,504
Claims priority, application Japan, Dec. 10, 1975, 50/146437
Int. Cl.² F25B *39/02, 43/00*
U.S. Cl. 62—504 **11 Claims**



1. A refrigerator comprising:

refrigerating cycle means including first cooling means and a liquid tank for charging a working fluid from said first cooling means;

at least one closed loop means branched from said refrigerating cycle means and including an inverted U-type tube in which working fluid flows from the inlet to the outlet by means of a vapor bubble pumping action, a first connecting tube for supplying the working fluid from said liquid tank to the inlet of said inverted U-type tube, a heating means disposed around the inlet of said inverted U-type tube, a second cooling means to which the working fluid is supplied from the outlet of said inverted U-type tube, and a second connecting tube for directly returning the working fluid from said second cooling means to said liquid tank.

4,130,998
ADJUSTABLY TURNABLE SHAFT-GUARD

Kenneth D. Einsel, and Roland W. Johnson, both of Hastings, Nebr., assignors to Hastings Equity Grain Bin Mfg. Co., Hastings, Nebr.

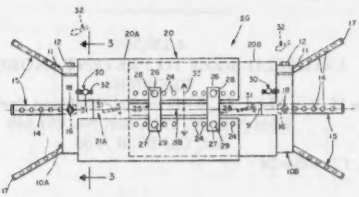
Filed Nov. 26, 1976, Ser. No. 745,089
Int. Cl.² F16L *1/06*
U.S. Cl. 64—3 **7 Claims**

1. An adjustably radially turnable shaft-guard in combination with a de-powered but rotatably powerable elongate shaft-assembly extending lengthily along a longitudinal central-axis from a stationary first-housing to a stationary second-housing, said shaft-assembly being provided with a plurality of co-rotatable lubricatable zerks, said radially turnable shaft-guard extending along a longitudinal-axis which is superimposed upon said central-axis and is held non-turning whenever the shaft-assembly is in rotatably powered running condition, said shaft-guard permitting zerk lubrication when the shaft-assembly is de-powered and comprising:

A. a first-yoke and a second-yoke, said first-yoke being non-rotably mounted to the first-housing and said second-yoke being non-rotably mounted to the second-housing, the first-yoke and the second-yoke respectively surrounding the central-axis as collars of sufficiently short length to non-obscure the lubricatable zerks;

B. a first-tube turnably associated with the first-yoke and having a longitudinally extending window-like first-slot that is radially alignable with a first-zerk of the shaft-assembly, said first-tube being of substantially C-shaped cross-section by virtue of a longitudinally co-extensive first-slot;

C. a second-tube turnably associated with the second-yoke and being of substantially C-shaped cross-section by virtue of a longitudinally co-extensive second-slot that is radially alignable with a second-zerk of the shaft-assembly, said second-tube being telescopically associated with the first-tube along the longitudinal-axis to allow the shaft-guard to be made substantially co-extensive with the



rotatable shaft-assembly length from first-housing to second-housing;

D. removably securable intertubes co-arresting means to maintain the selected telescoped collective length of first-tube and second-tube and to also maintain said tubes in co-turnable relationship, said co-arresting means comprising;

i. longitudinal alignment of first-slot and second-slot,

ii. a plurality of longitudinally spaced registrable holes for the first-tube and the second-tube along both edges of first-slot and second-slot thereof,

iii. at least one bridger spanning the said two longitudinally aligned tube slots, and

iv. removable fasteners passing through registering holes of both said tubes and said bridger member; and

E. removably securable turning control means extending from at least one of the co-arrested tubes to at least one of the stationary yokes to permit the tubes to remain stationarily non-turnable whenever the shaft-assembly is in rotatably powered running condition, and which also permits the aligned first-slot and second-slot to be adjustably radially alignable with the shaft-assembly lubricatable zerks at its de-powered stopped condition.

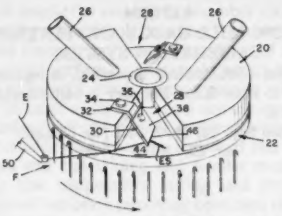
4,130,999
YARN BINDER APPARATUS

Roger L. Whittaker, Mocksville, N.C., and Clyde Hewitt, Hartsville, S.C., assignors to Hanes Corporation, Winston-Salem, N.C.

Filed Jun. 3, 1977, Ser. No. 803,021
Int. Cl.² D04B *15/50*
U.S. Cl. 66—145 R **8 Claims**

1. Apparatus in a knitting machine for holding a tensioned elastomeric yarn adjacent a severed end portion comprising; support means including a flat surface, an elongated binder element of spring steel construction having one end fixedly mounted upon said support means and having a displaceable free end portion defining a blade-like edge for normally engag-

ing said flat surface, said binder element being angularly positioned relative to said flat surface such that said free end portion of said binder element is displaceable in a first direction by the elastomeric yarn as the yarn moves in a first path between



said binder element and said flat surface, and is displaceable to a second position for wedging and biting into the elastomeric yarn to grip the yarn between said binder element free and said flat surface due to the retractive forces in the tensioned elastomeric yarn upon severing of the yarn.

4,131,000

PATTERN PRINTING APPARATUS

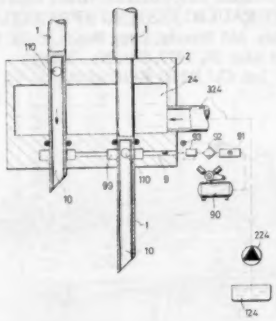
Mathias Mitter, Falkenstrabe 57, 4815 Schloss Holte, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 735,198, Oct. 26, 1976. This application Sep. 6, 1977, Ser. No. 830,443

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640131

Int. Cl.[2] D06B *1/08, 11/00*

U.S. Cl. 68—200 **11 Claims**



1. In a pattern printing apparatus, a combination comprising a plurality of reciprocatory printing elements each having a printing-medium space and a leading end provided with an outlet from said space; means for reciprocating each of said elements between an advanced printing position in which said outlet is located at a workpiece to be printed, and a retracted position; means for charging printing medium into the respective space during movement of said elements between said positions; and means for forcibly expelling the printing medium from the respective space when said elements are in said printing position.

4,131,001

METHOD TO PREVENT UNAUTHORIZED USE OF CASSETTE TAPE RECORDERS AND A DEVICE ACCORDING TO THE METHOD

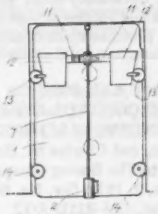
Raymond J. Gotto, Vallhornsvägen 2, Trängsund, Sweden (S-142 00)

Filed Nov. 16, 1976, Ser. No. 742,349

Claims priority, application Sweden, Nov. 17, 1975, 7512869

Int. Cl.[2] E05B *73/00*

U.S. Cl. 70—14 **19 Claims**



1. A device for preventing unauthorized use of a cassette tape recorder comprising a hollow body having a substantially flat rectangular outer casing corresponding in size and shape to a standard tape recorder cassette and locking means associated with said body for locking said body in a cassette opening of a tape recorder by engagement of a part of said locking means with a part of said tape recorder within said cassette opening, said locking means including means defining a lock opening in said casing, a rotary lock cylinder having a keyhole accessible from the exterior of said casing, a movable locking member within said casing having projected and retracted positions with respect to said lock opening and transmission means within said casing connected between said lock cylinder and said locking member for converting rotation of said cylinder into projecting and retracting movements of said locking member with respect to said opening.

4,131,002

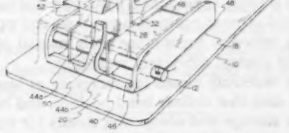
DOOR LATCH

Angelo Gianelo, 1383 S. 1900 East, Salt Lake City, Utah 84108

Filed Aug. 29, 1977, Ser. No. 828,283

Int. Cl.[2] E05C *3/08*

U.S. Cl. 70—84 **7 Claims**



1. A door latch comprising:

a mounting member which is rectalinear in shape and formed with a flange about its perimeter, said mounting member having mounting means and a recess formed in its front, said recess being rectalinear in shape and having a bottom and sides with an aperture formed in said bottom;

a shaft secured to said mounting member in said recess proximate said aperture;

a latch member having a bottom, top, front, back and two spaced apart legs extending along its bottom toward its front is mounted to said shaft through said legs proximate said bottom to extend from said recess through said aperture with a striking surface inward of said bottom which angles from said top frontwardly toward said bottom to

form a latching lip, said aperture being sized so that said latch member is rotatable between a latched position and an unlatched position;

biasing means secured to said mounting member to bias said latch member toward the latched position; and

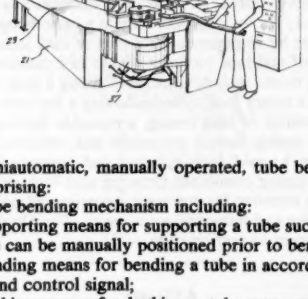
a rectalinearly shaped paddle which has a first edge opposite a second edge and which is positioned within said recess and mounted to said shaft along said first edge, said paddle having a pawl extending inwardly from said first edge along the front of said latch member between said legs to coact with said latch member so that upon movement of said second edge outwardly from said recess said pawl contacts said latch and rotates it from said latched position to said unlatched position upon operation of said paddle.

4,131,003

SEMIAUTOMATIC CONTROL SYSTEM FOR TUBE BENDING MACHINE

Gene B. Foster, Seattle, and Charles M. Baker, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Jun. 7, 1977, Ser. No. 804,352
Int. Cl.² B21D *7/12*
U.S. Cl. 72—7 **31 Claims**



1. A semiautomatic, manually operated, tube bending machine comprising:

(A) a tube bending mechanism including:

(1) supporting means for supporting a tube such that said tube can be manually positioned prior to bending;

(2) bending means for bending a tube in accordance with a bend control signal;

(3) locking means for locking a tube supported by said supporting means in a fixed position prior to bending; and,

(4) position sensing means for sensing the position of a tube supported by said supporting means and producing position information related thereto; and,

(B) a control subsystem connected to said tube bending mechanism for determining when said tube has been manually moved to the correct position for bending by said bending means, warning an operator when said correct position is being approached, actuating said locking means when said correct position is reached and operating said bending means in accordance with manual operator control, said control subsystem including:

(1) data receiving means for receiving at least one set of bend data that defines bend position and bend angle;

(2) data storage and comparing means for storing said at least one set of bend data, comparing stored bend position data with the position information produced by said position sensing means and actuating said locking means when said stored bend position data compares with said position information;

(3) manually operable bend actuate means for producing a bend actuate signal when manually operated;

(4) bend control means connected to said manually operable bend actuate means for producing a bend control signal when said manually operable bend actuate means is manually actuated, said bend control signal being applied to said bending means so as to cause said bending means to bend said tube; and,

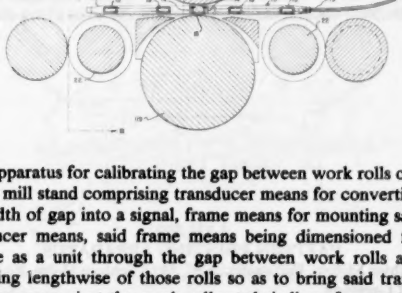
(5) warning means connected to said data storage and comparing means for producing a warning when a tube, as it is manually moved, causes said position information produced by said position sensing means to denote that said tube is approaching the positions defined by said stored bend position data.

4,131,004

ROLLING MILL GAUGE AND FLATNESS CALIBRATION SYSTEM

Werner W. Eibe, McClandless Township, Allegheny County, Pa., assignor to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

Filed Sep. 14, 1977, Ser. No. 833,262
Int. Cl.² B21B *37/00*
U.S. Cl. 72—8 **8 Claims**



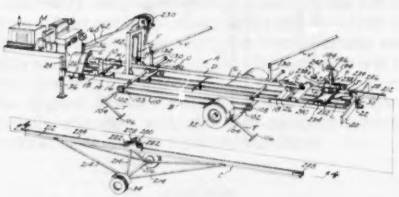
1. Apparatus for calibrating the gap between work rolls of a rolling mill stand comprising transducer means for converting the width of gap into a signal, frame means for mounting said transducer means, said frame means being dimensioned for passage as a unit through the gap between work rolls and extending lengthwise of those rolls so as to bring said transducer means against the work rolls at their line of contact in load transmitting relation therebetween and for removal therefrom, and means for conducting the signals from said transducer means out of the gap.

4,131,005

TUBULAR MEMBER STRAIGHTENING, DESCALING AND HYDRAULIC TESTING APPARATUS

Whetstine B. Pridy, 861 Stevely, Long Beach, Calif. 90815

Filed May 20, 1977, Ser. No. 798,819
Int. Cl.² B21D *7/04, 43/00*
U.S. Cl. 72—40 **13 Claims**



1. An apparatus that includes an elongate bed having a forward and a rearward end on which an elongate metallic tubular member having a forward threaded end and a rearward threaded end may be removably supported in a longitudinally extending position to be straightened, have products of corrosion removed from the exterior surface thereof, and hydraulically tested to a desired pressure prior to being moved from said position, said apparatus including:

a. first means for removably supporting said tubular member in said longitudinal position on said bed;

b. a driving assembly for removably engaging said forward

end of said tubular member when the latter is disposed in said longitudinal position to rotate said tubular member;

c. a power operated carriage longitudinally movable on said bed;

d. second power operated means on said carriage for pressure and frictionally engaging sequential sections of said tubular member as said tubular member rotates on said bed to straighten said tubular member by transversely deforming said sections and remove products of corrosion from the exterior surface by frictional contact therewith;

e. third means for discharging a stream of low pressure water through a passage in said driving assembly into said forward end of said tubular member, with said stream of water discharging from the rearward end of said tubular member and maintaining said tubular member at a sufficiently low temperature during said straightening and product of corrosion removing operation that the physical characteristics of the metal defining said tubular member are not impaired;

f. fourth means for preventing said water discharging from said forward end of said tubular member;

g. fifth means for removably sealing said rearward end of said tubular member when the latter is stationary and said tubular member at least partially filled with said low pressure water after being so sealed;

h. sixth power operated means for discharging high pressure water into said tubular member to completely fill the same and subject the interior of said tubular member to a predetermined pressure;

i. seventh means in communication with the interior of said tubular member to indicate when said predetermined pressure has been reached; and

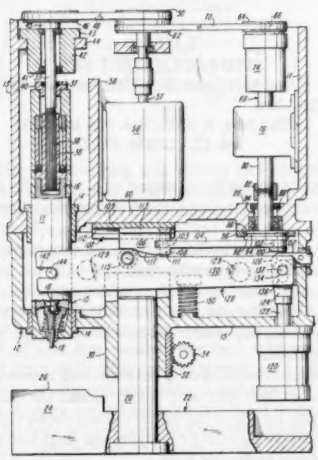
j. first power means for selectively actuating said driving assembly, power operated carriage, second power operated means and sixth power operated means.

4,131,006

FIXED MECHANICAL FEED FOR A RIVETING DEVICE

Harry E. Kohl, Kettering, Ohio, and Gordon Cotton, Chelsea, Mich., assignors to The International Tool Company, Dayton, Ohio

Filed Feb. 27, 1978, Ser. No. 881,670
Int. Cl.² B21D *15/12, 15/26*
U.S. Cl. 72—67 **21 Claims**



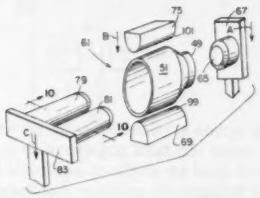
1. Riveting apparatus comprising a generally vertically oriented spindle assembly including a drive shaft and a housing for said shaft mounting for movement to and from a work surface, said shaft being rotatable in and independently of said housing and the leading end thereof being adapted to mount a riveting tool which in the movement of said housing towards the work surface is applied to fix a rivet, a lever-like unit one end of which is operatively connected to said housing and the opposite end of which is pivotally connected to a control member to establish the position of the pivot thereof, and means operatively related to said lever-like unit to produce a movement of said lever-like unit about said pivot to cyclically and uniformly advance and retract said housing and said shaft with reference to said work surface.

4,131,007

COUPLING DEVICE FOR CONNECTING A PLURALITY OF PORTS TO ONE PIPE-METHOD OF MAKING SAME

James R. Laundy, Racine, Wis., assignor to Tenneco, Inc., Racine, Wis.

Division of Ser. No. 683,560, May 5, 1976, Pat. No. 4,082,325.
This application Oct. 13, 1977, Ser. No. 841,837
Int. Cl.² B21D *22/00*
U.S. Cl. 72—348 **6 Claims**



1. The method of making a body for use in a coupling device to connect two ports to one port comprising the steps of forming a circular sheet metal disk, drawing the disk into a cup with first and second ends and having a longitudinal axis that is open at one end and has a substantially hemispherical shape at the other end and is of a substantially uniform diameter cylindrical shape between said hemispherical shape and said open end, piercing the hemispherical end of the cup to form an opening therein and convert the cup into a shell that is open at both ends, placing the opening in the hemispherical end of the shell on a movable support and inserting a pair of mandrels carried by a movable support into the other end of the shell, said mandrels having an overall width substantially equal to said uniform diameter shape, and applying compressive pressure by a ram and die means to opposite sides of the uniform diameter shape substantially along a midplane of the shell and substantially midway between the mandrels to shape the shell metal around the mandrels while moving said movable supports and said ram and die means such that the movable supports move at substantially one half the rate of movement of the ram and die means whereby said uniform diameter shape is changed to a substantially FIG. 8 cross sectional shape along the lengths of the mandrels and the remainder of the shell except for said opening in the hemispherical end is changed to a substantially oval cross sectional shape.

4,131,008

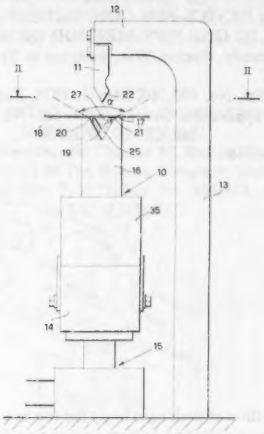
DEVICE FOR MEASURING THE BENDING ANGLES IN PLATE-BENDING MACHINES

Renzo Malatto, Milan, Italy, assignor to Selecontrol S.A.S., Lecco (Como), Italy

Filed Jan. 30, 1978, Ser. No. 873,529
Claims priority, application Italy, Feb. 1, 1977, 7202 A/77
Int. Cl.² B21D *7/06*
U.S. Cl. 72—389 **6 Claims**

1. A device for measuring the angles of bend in sheet metal bending presses of the kind comprising a die with a resting plate through which a longitudinal groove is formed the edges of which are radiussed with a determined radius of curvature to the resting plane, a punch having the shape of a "counter-V" and means adapted to effect movements of said die and said

punch toward and away of one another in a direction perpendicular to the die resting plane so as to have the counter-V shaped point of the punch remaining on the central plane of symmetry of the die groove, characterized in that it comprises a detecting member equipped with a head, said detecting member being arranged in a linearly displaceable manner in a guideway formed through the die and which is extended from a point of the die groove on the plane of symmetry of the groove perpendicularly to the resting plane, the head of the detecting member having, as formed on its front surface, a notch aligned



with the die groove and radiussed to the front surface of the detector head by edges having the same radius of curvature as the edges of the V-shaped die groove, resilient means active between the die and the detecting member for displacing the latter in its own guideway in the sense of having it exiting the V-shaped die groove, stopping means for keeping the detecting member in an inactive position, and means, cooperating with the detecting member, which are adapted to convert the linear displacement thereof into a command or signal of indication of the angle of bend of the metal sheet undergoing bending.

4,131,009

APPARATUS FOR CONTINUOUSLY FIXING A PLURALITY OF TUBULAR FASTENERS ONE BY ONE TO A PLURALITY OF APERTURES PROVIDED IN A SUPPORT PANEL

Kunio Hara, Kawasaki, and Kohsaku Yoshida, Funabashi, both of Japan, assignors to Nichi-Ei Bussan Co., Ltd., Tokyo, Japan

Filed Nov. 3, 1976, Ser. No. 738,463
Claims priority, application Japan, Nov. 14, 1975, 50-136154
Int. Cl.[2] B21D *9/05*; B21B *15/00*; B23C *1/00*; B23P *17/00*
U.S. Cl. 72—391 **4 Claims**

1. An apparatus for continuously feeding and fixing a plurality of so-called pull-lock type, tubular fasteners, each of said tubular fasteners comprising a shaft portion with an upper head and a lower flange and an upper flanged collar portion tightly surrounding the lower portion of said shaft, one by one to a plurality of apertures in a panel or a plurality of aligned apertures in two or more superimposed panels, comprising:

a casing with a handle on a sidewall thereof, said casing defining an one-end closed main cylinder,

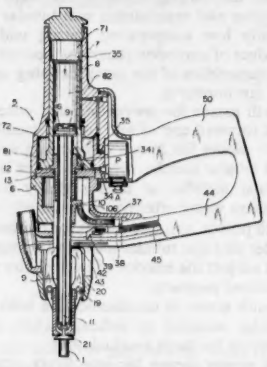
outer piston means having a throughbore concentrically and slidably telescopd within the throughbore of said main cylinder,

slide cam means depending from and rigidly connected to said outer piston means and having timed controlling cam means and fastener holding means at the forward end for fixing the loaded fastener onto the aperture of the panel,

a piston-type main shaft having a throughbore and a fastener loading groove at its forward end and concentrically and slidably telescoped within the throughbore of said outer piston means so as to pull up the shaft portion of the loaded fastener against the securely held collar portion thereof,

a fastener pressing plunger concentrically depending within the throughbore of said main shaft for securing said plunger within the fastener loading groove,

fastener feeding means provided on one side of the casing for receiving the fastener assembly and for feeding the fasteners one by one and one after another to the fastener loading groove at the forward end of the main shaft,



means carried by said casing at the forward end thereof for severing the upper shaft portion of the fastener above its collar portion,

shaft expelling means provided in the casing on the side opposite to said fastener feeding means and adapted to expel the severed upper shaft portion of the fastener from the fastener loading groove simultaneously with feeding the succeeding fastener into the thus vacated groove, and

pressured fluid feeding means associated with timed valve mechanism for driving the above-mentioned respective means in a timed and coacting relation.

4,131,010

HYDRAULIC TEST SET

William G. Eyres, Salt Lake City, Utah, assignor to E-Systems, Inc., Dallas, Tex.

Filed Nov. 9, 1977, Ser. No. 849,770
Int. Cl.[2] G01M *19/00*
U.S. Cl. 73—11 **10 Claims**

1. Apparatus for in-place testing of a hydraulic shock suppressor having a piston that divides the interior chamber of the shock suppressor into cavities and having a hydraulic fluid reservoir for housing hydraulic fluid which comprises:

means for storing hydraulic fluid,

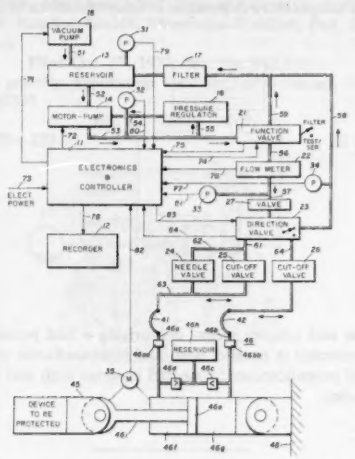
pump means interconnected to said means for storing hydraulic fluid for pumping hydraulic fluid into the cavities of the shock suppressor from said means for storing hydraulic fluid,

valve means interconnected between said means for storing hydraulic fluid and said pump means for pumping the hydraulic fluid into the cavities of the shock suppressor or alternatively directing the hydraulic fluid into said means for storing hydraulic fluid,

means interconnected to said valve means for controlling the direction of flow of the hydraulic fluid into the cavities of the shock suppressor,

means interconnected between said pump means and said valve means for controlling the rate of flow of the hydraulic fluid flowing into the cavities of the shock suppressor,

means for measuring the rate of flow of the hydraulic fluid flowing to the cavities of the shock suppressor, and



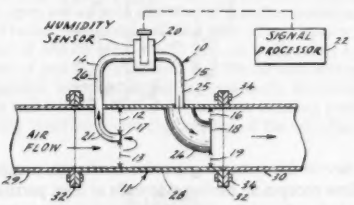
means for measuring the movement of the piston within the shock suppressor in response to the fluid flowing into the cavities of the shock suppressor.

4,131,011

METHOD AND DEVICE FOR DETERMINING THE END POINT FOR DRYING

Wilfred C. Ling, Lake Bluff, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 28, 1977, Ser. No. 772,719
Int. Cl.[2] G01N *19/10*
U.S. Cl. 73—29 **7 Claims**



1. A device for diverting and sensing moisture in a sample portion from a main conduit stream of fluid flowing from an upstream to a downstream direction comprising:

a first conduit member;

a second conduit member, both said conduit members adapted for fluid-tight communication with said channel and each having an orifice at one end and in open communication with said main conduit, said orifice of said second conduit member being of a larger dimension than said orifice of said first conduit member, said orifices being spaced from each other in said stream with said first orifice being positioned upstream of said second orifice; and

moisture sensing means adapted for fluid communication with the ends of said conduit members opposite said orifices, said orifices of said first and second conduits adapted to be placed in said stream of fluid with both said orifices facing in a downstream direction with respect to said flow;

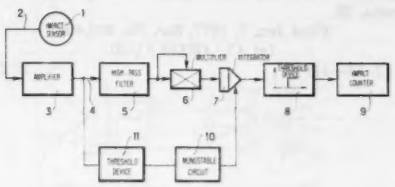
said first and second conduit members and said sensing means defining an open fluid flow path with said conduit stream to thereby effect the flow of fluid from said stream of fluid into said orifice of said first conduit member and in a direction opposite said fluid flow, through said first conduit member, said moisture sensing means, said second conduit member, out of said orifice of said second conduit member and into said stream of fluid.

4,131,012

DEVICE FOR DETECTING IMPACTS ON A TARGET

Bernard Courtiol, Grenoble, France, assignor to CGEE Alsthom, Levallois-Perret, France

Filed Feb. 10, 1978, Ser. No. 876,802
Claims priority, application France, Feb. 22, 1977, 77 05156
Int. Cl.[2] G01L *5/14*
U.S. Cl. 73—167 **6 Claims**



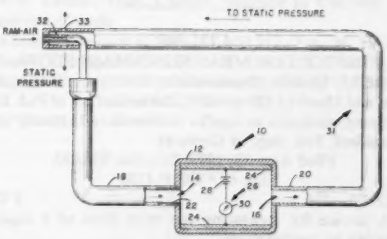
1. A device for detecting a quantity of energy striking a solid body, the device comprising at least one sensor transforming the mechanical vibrations to which the body is subjected into an electrical signal and, in series, an amplifier receiving said signal, a high-pass filter, a multiplier, an integrator, a threshold detector and a monostable pulse shaping circuit, and said device further comprises a threshold device for detecting the peaks of said electrical signal a monostable flip flop connected to said threshold device and triggered thereby and connected to said integrator, such that the monostable flip flop logic output signal effects operation of said integrator.

4,131,013

IONIC AIR SPEED INDICATOR

Maynard L. Hill, Silver Spring, and Theodore R. Whyte, Fulton, both of Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Jul. 25, 1977, Ser. No. 818,765
Int. Cl.[2] G01P *5/08*
U.S. Cl. 73—181 **7 Claims**



1. An apparatus for measuring the speed of a moving body, comprising:

a source of positive and negative ions,

two parallel conducting plates,

means, connected to the conducting plates, for generating a constant voltage and an electric field between the plates, means, connected to the source, for directing a fluid first into the source to ionize the fluid, and for directing the ionized fluid between the conducting plates, causing charge separation in the field and an attendant electric current between the plates, wherein the fluid directing means comprises:

a ram-air input, connected outside the moving body, for inletting a flow of air while the body is in motion, and

first tubular means for connecting the ram-air input and the source of ions, and

means, connected between the conducting plates, for sensing variations in the electric field between the conducting plates,

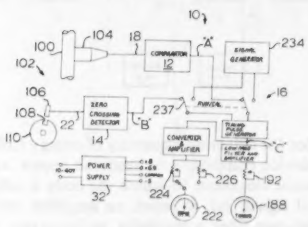
wherein the speed of the moving body is a function of the rate of flow of the fluid and the rate of flow of the fluid is measured by the current between the plates.

4,131,014

DYNAMIC TIMING INDICATING APPARATUS

Ronald K. Scott, Buda, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jun. 7, 1977, Ser. No. 804,408
Int. Cl.² G01M *15/00*
U.S. Cl. 73—119 A **20 Claims**



13. Dynamic timing indicating apparatus, comprising:

comparing means for receiving a first input signal and delivering a preselected output signal "A" in response to said first input signal;

zero-crossing detecting means for receiving a second input signal having positive, negative, and zero-crossover portions occurring in timed relation to said first signal and delivering a preselected output signal "B" in response to said zero-crossover portion of said second input signal;

means for automatically indicating the timed relation between said first and second input signals in response to and as a function of the outputs of said comparing means and zero-crossing detecting means; and

means for generating preselected signals substantially similar in timed relation to said output signals "A" and "B".

4,131,015

DEVICE FOR MEASURING MASS FLOW

Jogindar M. Chawla, Durmersheim; Peter von Böckh, Karlsruhe, and Manfred Dörnemann, Dusseldorf, all of Fed. Rep. of Germany, assignors to Agefko Kohlensäure-Industrie GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Aug. 25, 1977, Ser. No. 828,255
Int. Cl.² G01F *1/28*
U.S. Cl. 73—199 **9 Claims**

1. A device for measuring the mass flow of a liquid gas comprising in combination;

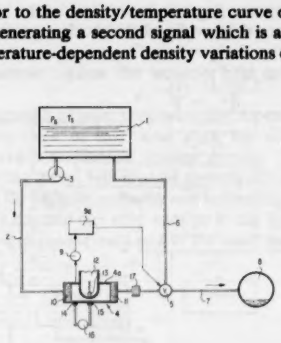
(a) a tube having a flow inlet and a flow outlet and defining a flow passage for the liquid gas;

(b) a throttle piston projecting transversely into the flow passage and having a spherical terminus defining, with an oppositely lying inner wall portion of said tube, a throttled part of said flow passage;

(c) head difference measuring means for generating a first signal as a function of the difference of the pressure head at said throttled part and upstream thereof;

(d) a temperature-dependent semiconductor exposed to the temperature of the liquid gas flowing through said tube; and

(e) adapter means connected to said semiconductor for adapting the resistance/temperature curve of said semiconductor to the density/temperature curve of the liquid gas for generating a second signal which is a measure of the temperature-dependent density variations of the liquid



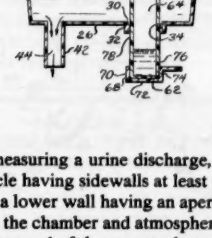
gas; said adapter means comprising a first potentiometer connected in parallel with said semiconductor and a second potentiometer connected in series with said semiconductor.

4,131,016

PEAK FLOW MEASURING DEVICE

Terry N. Layton, Wheeling, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Nov. 9, 1977, Ser. No. 849,747
Int. Cl.² G01F *1/20*
U.S. Cl. 73—215 **8 Claims**



1. A device for measuring a urine discharge, comprising:

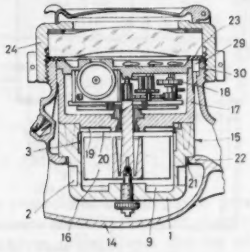
a hollow receptacle having sidewalls at least partially defining a chamber, a lower wall having an aperture communicating between the chamber and atmosphere, an inlet port adjacent an upper end of the receptacle and communicating with the chamber to receive the discharge for passage into the chamber, and an outlet port adjacent a lower end of the receptacle and communicating with the chamber for passage of the discharge at a predetermined rate out of the chamber;

a collection container having a closed bottom, an elongated generally tubular section defining a collection cavity in the container, and an opening adjacent an upper end of the container communicating with said cavity, said container being removably received in the receptacle aperture with the container opening spaced a predetermined distance above the lower receptacle wall in said chamber, and with the receptacle sealingly engaging against a surface of the container in the region of said aperture, such that the discharge passes from the receptacle chamber through the container opening into said cavity at a predetermined height of the liquid in said chamber to provide a discrete indication of the discharge peak flow rate and a specimen of the discharge in said cavity for analysis upon removal of the container from the receptacle.

4,131,017
VANE TYPE METER

Walter Back, Mannheim, Fed. Rep. of Germany, assignor to Bopp & Reuther GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Oct. 17, 1977, Ser. No. 842,923
Claims priority, application Fed. Rep. of Germany, Oct. 20, 1976, 2647297
Int. Cl.² G01F 1/06
U.S. Cl. 73—229 13 Claims



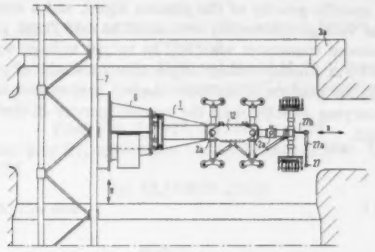
1. In a vane type meter, a combination comprising a cup-shaped impeller housing having a bottom wall and a peripheral wall projecting upwardly from said bottom wall; an even number of inlet channels extending uniformly spaced from each other through said peripheral wall substantial tangential to the inner surface of the latter; a plurality of outlet channels equal in number to that of the inlet channels and extending uniformly spaced from each other through said peripheral wall above said inlet channels also substantially tangential to the inner surface of said peripheral wall, said channels having rectangular cross-section defined laterally by planar faces inclined with respect to each other so that the open cross-section of each channel tapers towards the inner surface of said peripheral wall; a cup-shaped counter housing mounted on said cup-shaped impeller housing and having a bottom wall closing the upper open end of said cup-shaped impeller housing; and a pluraliy of radially extending ribs on each of said bottom walls, the number of ribs on each of said bottom walls being equal to the number of said inlet channels, the ribs on said bottom wall of said impeller housing projecting upwardly therefrom and the ribs on said bottom wall of said counter housing projecting downwardly therefrom into the interior of the impeller housing.

4,131,018
ELBOW OR BENT TUBE MANIPULATOR, ESPECIALLY FOR ULTRASONIC TESTING IN NUCLEAR REACTOR INSTALLATION

Otto Müller, Spardorf; Georg Gugel, Kalchreuth, and Hans Kastl, Neustadt, Waldnaab, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Sep. 7, 1977, Ser. No. 831,111
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1976, 2640055
Int. Cl.² G01N 29/04
U.S. Cl. 73—432 R 18 Claims

1. Manipulator assembly for testing the material of a pipe elbow from the inside thereof, the pipe elbow being secured to a pipe union extending from a pressure vessel openable for receiving therein a vertically extending manipulator mast having an arm carrying a manipulator, the manipulator being movable by the arm in vertical direction, rotatably about the axis of the mast and in direction of the longitudinal axis of the arm and transversely thereto, the manipulator comprising a multimember vehicle drivable in direction of the pipe-union and pipe-elbow axis, the members of said vehicle being articulatingly connected to one another and having extensible and retractable support legs for supporting the respective vehicular members centered relative to the inner periphery of the pipe elbow, said support legs having roller members at the end thereof for transporting the vehicular members in axial direction of the pipe union and the pipe elbow, the vehicular member located at the head of said multimember vehicle being a test system carrier and being drivable with said vehicle in axial direction of the pipe union and the pipe elbow, said test system carrier having a test system fastened to at least one test arm and mounted so as to be rotatable along predetermined test tracks in circumferential direction of the pipe elbow, drivable radially inwardly and outwardly with said test arm and centerable on the respective center of the pipe elbow, said vehicular mem-

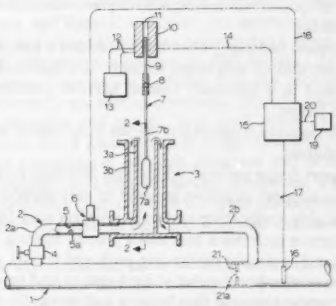


bers and said test system carrier being mutually engaged by articulating couplings and longitudinally adjustable drive members so that, in an extended readiness position thereof wherein the manipulator is disposed in front of the pipe union, said vehicular members and said test system carrier are oriented in axial direction of the pipe union, are centered on the pipe-union center and are rigidly coupled to one another, whereas in a travelling position thereof wherein at least said test system of the manipulator is located within the pipe elbow, said vehicular members and said test system carrier are loosely coupled to one another so that they adapt themselves to the curvature of the pipe elbow as they travel in axial direction thereof.

4,131,019
METHOD AND APPARATUS FOR MEASURING SPECIFIC GRAVITY OF LIQUIDS IN PROCESS STREAMS

Clifford J. Krauss, Trail, Canada, assignor to Cominco Ltd., Vancouver, Canada

Continuation-in-part of Ser. No. 652,912, Jan. 28, 1976, abandoned. This application Mar. 17, 1977, Ser. No. 778,917
Claims priority, application Canada, Apr. 10, 1975, 224552
Int. Cl.² G01N 9/18
U.S. Cl. 73—453 2 Claims



1. An apparatus for measuring the specific gravity of a liquid from a process stream which comprises, in combination, a

process liquid line, a constant level overflow device, means interconnecting the process liquid line and overflow device for intermittently supplying a volume of process liquid to fill said overflow device and for displacing process liquid from said overflow device, a variable immersion hydrometer positioned in said constant level overflow device, a linear voltage displacement transducer consisting of a differential transformer with built-in carrier oscillator and phase-sensitive demodulator having a core loosely embraced therein, said immersion hydrometer consisting of a submergible weighted bulbous portion and a stem extending upwardly therefrom, and flexible coupling means for connecting the core to the stem, whereby said hydrometer and core are vertically displaced dependent on the specific gravity of the process liquid, and a source of constant voltage electrically connected to said linear voltage displacement transducer whereby an output voltage signal is emitted by said linear voltage displacement transducer proportional to the position of the core therein, said output voltage signal varying directly with the specific gravity of the liquid measured.

4,131,020

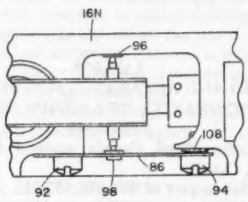
ACCELEROMETER

Hans W. Hugli, and John M. Kubler, both of Bellevue, Wash., assignors to Sundstrand Data Control, Inc., Redmond, Wash.

Filed Jul. 6, 1976, Ser. No. 702,382

Int. Cl.[2] G01P *15/08*

U.S. Cl. 73—517 B **33 Claims**



1. An accelerometer comprising:

a housing;

a pair of spaced parallel capacitive plates secured within said housing;

a pendulum including a beam member and a paddle attached to one end of said beam member wherein said paddle is located in a generally spaced parallel position between said plates;

an axle secured transversely to the longitudinal axis of said pendulum;

a support frame secured within said housing; and

an axle support structure secured to said support frame for rotatably supporting said axle wherein said axle support structure includes a first and a second bearing for receiving and rotatably supporting each end of said axle, a first flexure member secured at each end to said support frame for supporting said first bearing and means for supporting said second bearing wherein said axle support structure additionally includes means for adjusting pressure of said bearings on said axle.

4,131,021

HIGH RESOLUTION PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM

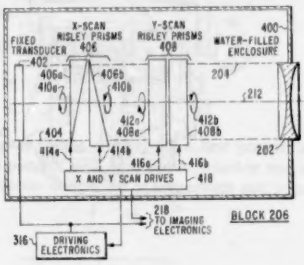
Reuben S. Mezrich, Rocky Hill, and Edwin T. Koenig, Spring Lake Heights, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,564

Claims priority, application United Kingdom, Mar. 4, 1976, 08660/76; Jul. 16, 1976, 29766/76

Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—606 **9 Claims**



1. Apparatus for use in an ultrasonic pulse-echo system capable of displaying an image of certain internal structure of a visually opaque object being scanned with ultrasonic wave energy, said apparatus comprising:

an acoustic focusing device occupying a given aperture which aperture remains substantially fixed in position with respect to said object while said object is being scanned, and

ultrasonic beam forming means including transducer means generating successive pulses of ultrasonic wave energy and beam scanning means for illuminating said certain internal structure through said focusing device with a scanning focused beam of said pulsed ultrasonic wave energy, said transducer means being situated remotely from both said focusing device and from said internal structure for receiving and detecting a signal portion of said focused beam reflected from said certain internal structure and returned through said focusing device to said transducer means after a time delay proportional to the distance between said remotely situated transducer means and said certain internal structure.

4,131,022

PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM

Reuben S. Mezrich, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,527

Claims priority, application United Kingdom, Mar. 4, 1976, 08661/76; Jul. 16, 1976, 29763/76; Jul. 16, 1976, 29764/76; Jul. 16, 1976, 29765/76

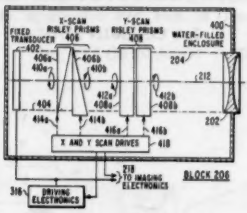
Int. Cl.[2] G01N *29/00*

U.S. Cl. 73—606 **11 Claims**

1. In apparatus for use in an ultrasonic pulse-echo system capable of displaying an image of certain internal structure of a visually opaque object being scanned with ultrasonic wave energy, said apparatus including an acoustic focusing device occupying a given aperture which aperture remains substantially fixed in position with respect to said object while said object is being scanned, and ultrasonic beam forming means including transducer means generating successive pulses of ultrasonic wave energy and beam scanning means for illuminating said certain internal structure through said focusing device with a scanning focused beam of said pulsed ultrasonic wave energy, said transducer means being situated remotely from both said focusing device and from said internal structure for receiving and detecting a signal portion of said focused

beam reflected from said certain internal structure and returned through said focusing device to said transducer means after a time delay proportional to the distance between said remotely situated transducer means and internal structure; the improvement:

wherein said ultrasonic wave energy has a given wavelength λ and



wherein the respective sizes of given parameters of said focusing device are related to said given wavelength λ to provide a given focused spot size for said scanning focused beam and to provide a depth of field for said scanning focused beam which is at least several times said given focused spot size.

4,131,023
PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM

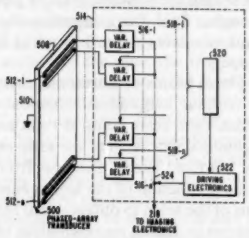
Reuben S. Mezrich, and Charles H. Anderson, both of Rocky Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,565

Claims priority, application United Kingdom, Mar. 4, 1976, 08661/76; Mar. 4, 1976, 08663/76

Int. Cl.² G01N *29/00*

U.S. Cl. 73—606 **5 Claims**



1. In apparatus for use in an ultrasonic pulse-echo system capable of displaying an image of certain internal structure of a visually opaque object being scanned with ultrasonic wave energy, said apparatus including an acoustic focusing device occupying a given aperture which aperture remains substantially fixed in position with respect to said object while said object is being scanned, and ultrasonic beam forming means including transducer means generating successive pulses of ultrasonic wave energy and beam scanning means for illuminating said certain internal structure through said focusing device with a scanning focused beam of said pulsed ultrasonic wave energy, said transducer means being situated remotely from both said focusing device and from said internal structure for receiving and detecting a signal portion of said focused beam reflected from said certain internal structure and returned through said focusing device to said transducer means after a time delay proportional to the distance between said remotely situated transducer means and internal structure; the improvement:

wherein said system displays said image of said certain internal structure in at least one frame, a frame comprising a first plurality of groups of image samples, each of said groups containing a second plurality of individual image sampls, and

wherein said beam scanning means comprises means for scanning an entire individual group of image samples in a first time period no greater than said time delay,

whereby respective signal portions of said focused beam corresponding to all said second plurality of individual image samples of any of said groups can be received and detected within the duration of a second time period equal to the sum of said first time period and said time delay and a frame can be displayed in a third time period equal to said first plurality of said second time periods.

4,131,024
PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM

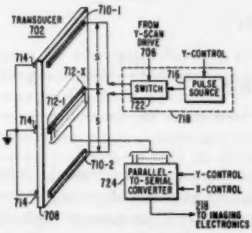
Reuben S. Mezrich, Rocky Hill, and David H. R. Vilkomerson, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,528

Claims priority, application United Kingdom, Mar. 4, 1976, 08663/76

Int. Cl.² G01N *29/00*

U.S. Cl. 73—606 **3 Claims**



1. In apparatus for use in an ultrasonic pulse-echo system capable of displaying an image of certain internal structure of a visually opaque object being scanned with ultrasonic wave energy, said apparatus including an acoustic focusing device occupying a given aperture which remains substantially fixed in position with respect to said object while said object is being scanned, and ultrasonic beam forming means including transducer means generating successive pulses of ultrasonic wave energy and beam scanning means for illuminating said certain internal structure through said focusing device with a scanning focused beam of said pulsed ultrasonic wave energy, said transducer means being situated remotely from both said focusing device and from said internal structure for receiving and detecting a signal portion of said focused beam reflected from said certain internal structure and returned through said focusing device to said transducer means after a time delay proportional to the distance between said remotely situated transducer means and internal structure; the improvement:

wherein said transducer means is situated in a given region in which said object is imaged by said focusing device, and said transducer means includes first and second parallel wave energy generating electrodes extending linearly in a first direction and spaced from each other by a certain distance, and a linear array of image-spot detecting electrodes extending in said first direction and situated halfway between said first and second electrodes, whereby all said detecting electrodes are the same given distance from said first electrode as they are from said second electrode, and

wherein said ultrasonic beam focusing means includes a pair of Risley prisms counter-rotating at a predetermined rate for linearly scanning said focused beam in second direction orthogonal to said first direction, said predetermined rate being related to said given distance such that during a certain half-cycle of rotation of said Risley prisms said

detection electrodes each receive a signal portion of said focused beam generated by said first electrode and during the remaining half-cycle of rotation of said Risley prisms said detecting electrodes each receive a signal portion of said focused beam generated by said second electrode.

4,131,025

PULSE-ECHO ULTRASONIC-IMAGING DISPLAY SYSTEM

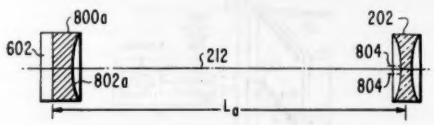
Reuben S. Mezrich, Rocky Hill, and Jeremiah Y. Avins, Kendall Park, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,526

Claims priority, application United Kingdom, Jul. 26, 1976, 31114/76

Int. Cl.² G01N *29/00*

U.S. Cl. 73—606 **6 Claims**



1. In apparatus for use in an ultrasonic pulse-echo system capable of displaying an image of certain internal structure of a visually opaque object being scanned with ultrasonic wave energy, said apparatus including an acoustic focusing device occupying a given aperture which aperture remains substantially fixed in position with respect to said object while said object is being scanned, and ultrasonic beam forming means including transducer means generating successive pulses of ultrasonic wave energy and beam scanning means for illuminating said certain internal structure through said focusing device with a scanning focused beam of said pulsed ultrasonic wave energy, said transducer means being situated remotely from both said focusing device and from said internal structure for receiving and detecting a signal portion of said focused beam reflected from said certain internal structure and returned through said focusing device to said transducer means after a time delay proportional to the distance between said remotely situated transducer means and internal structure; the improvement:

wherein said transducer means includes a substantially flat transducer plate situated with respect to said focusing device in an image plane of said object,

wherein said focusing device includes at least one large aperture acoustic lens exhibiting abberation which by itself would cause said flat transducer plate to be imaged in a given curved image field, and

wherein said beam forming means further includes a corrector plate situated between said transducer plate and said acoustic lens in substantially direct contact with said transducer plate, said corrector plate being made of a material exhibiting that predetermined normalized index of refraction with respect to its surroundings for said ultrasonic waves which is less than unity and having that predetermined varying thickness over its cross-section which makes said corrector plate substantially compensate for said abberation,

whereby the presence of said corrector plate results in said flat transducer plate to be imaged in a flat image field.

4,131,026

ULTRASONIC TESTING OF SEAMS

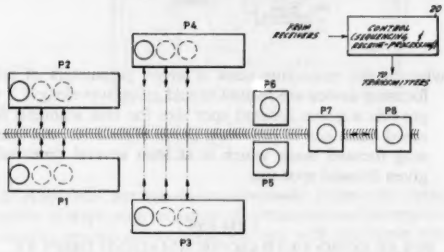
Karl Ries; Dieter Kaiser, both of Mülheim, and Klaus-Uwe Jannsen, Lintorf, all of Fed. Rep. of Germany, assignors to Mannesmannrohren-Werke AG, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 18, 1975, Ser. No. 641,910

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1974, 2460713

Int. Cl.² G01N *29/04*

U.S. Cl. 73—625 **7 Claims**



1. Method of testing the welding seam of pipes, comprising:

providing coupler fluid for contacting the pipe through which ultrasonic energy can be applied to and received from the pipe;

(i) directing plural beams of ultrasonic energy from lateral directions without longitudinal component towards the welding seam, each beam being at right angles in relation to the longitudinal extension of the seam entering the pipe at different but fixed lateral distances from the seam, and detecting the interaction of the beams energy with different portions of the seam to obtain signal representations of the interactions including representation of any longitudinal defect in the said portion of seams, the energy being coupled to and from the pipe outside of the seam proper;

(ii) directing ultrasonic energy towards the edges of the seam detecting interaction of the energy with a portion of the edges to obtain signal representation of such interaction including representation of any defect in such portions;

(iii) directing ultrasonic energy towards the seam from a longitudinal direction without transverse component and independently from step (1) and detecting from another longitudinal direction the interaction of the energy with a portion of the seam to obtain a signal representation of the interaction including representation of any transversely extending defect in the latter portion of the seam;

repeating the steps (i), (ii), (iii) sequentially on progressing portions of the seam in longitudinal direction to sequentially test the entire seam; and

processing the said signal representation as obtained pursuant to the steps (i), (ii), (iii) as repeated to obtain representation of the respective signal contour and of the transition times in each instance for identifying defects on the basis of correlated responses of sequential steps (i) and (iii).

4,131,027

APPARATUS FOR ULTRASONIC INSPECTION OF THE WELDING SEAM OF LARGE PIPES

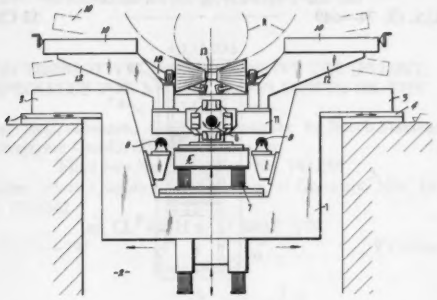
Wolfgang Terschüren; Karl Ries, both of Mülheim, and Dieter Lather, Rheurdt, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Feb. 10, 1977, Ser. No. 767,353

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2607011

Int. Cl.[2] G01N *29/04*

U.S. Cl. 73—638 7 Claims



1. Apparatus for inspecting the welding seam and its edge zones of large pipes for purposes of detecting flaws, comprising:

a first table having a plurality of parallelly oriented slide beds, defining directions of sliding transversely to a longitudinal direction along which a pipe to be inspected is moved;

a plurality of slides respectively slidably mounted in the beds;

a plurality of swing arms respectively mounted in the slides for pivoting on axes parallel to said longitudinal direction and extending down from the slides and generally along the lower surface of the pipe, the respective ends of the swing arms are positioned under the pipe for movement in radial direction towards the pipe's surface;

a first plurality of ultrasonic transducers, each said transducer being disposed in a container for coupler fluid, each container having a particular surface for engagement with a pipe thereby to orient the respective transducer in the container relative to the pipe's surface;

means for mounting each of said containers in gimbals and respectively to the ends of the arms to obtain an adjustable disposition of the transducers in the container in relation to the pipe, and for engagement of the respective container with the pipe, whereby the containers engage the pipe in pairs and in symmetric relation to the seam to be inspected;

means for resiliently bias the swing arms in a pivotal direction so that the containers engage the pipe's surface;

means for mutually orienting the table and the seam, so that each transducer in the containers has a particular reproduceable position in relation to the seam as defined by a position adjustment of the respective slide in its bed in the table;

a second plurality of ultrasonic transducers disposed in a container for coupler fluid;

means for mounting said latter container in gimbals;

means for positioning said latter means for mounting so that the transducer of the second plurality are aligned with said table and under the seam and the latter container engages the pipe at the seam;

a pair of transducers disposed in a third container;

means for mounting the third container in gimbals; and

means for positioning the means for mounting the third container so that the transducers therein assume testing position in relation to the edge zone of the seam and the third container engages the seam.

4,131,028

MOTION CONVERSION MECHANISM

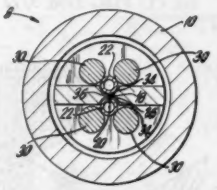
Stanley H. Gilman, White Plains, and Daniel M. Marcus, New River, both of N.Y., assignors to Gilman Manufacturing Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 551,613, Feb. 21, 1975, Pat. No. 3,990,317. This application Jul. 22, 1976, Ser. No. 707,760

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[2] F16H *21/16*

U.S. Cl. 74—25 9 Claims



1. A mechanism for conversion between rotary and linear motion comprising a rotatable roller carriage defining a channel for axial passage of a shaft; a plurality of rotatable drive rollers orbitally movable with the rotation of said roller carriage, and positioned along said channel to form an acute angle therewith in driving engagement with the shaft; a plurality of retaining rollers rotatably held by said roller carriage parallel to, and in contact with, said drive rollers to retain said drive rollers in a shaft engaging position; and drive means for driving said drive rollers in a rotary fashion to linearly advance the shaft.

4,131,029

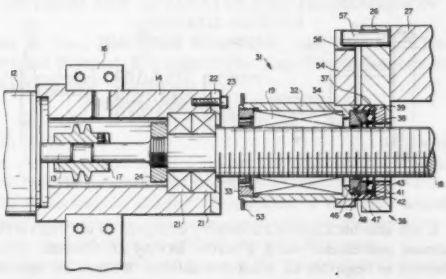
GIMBALLED COUPLING FOR LEAD SCREW AND NUT ASSEMBLY

Steven K. Harbaugh, Anaheim, and Frank R. Mitchell, South Pasadena, both of Calif., assignors to Eocom Corporation, Irvine, Calif.

Filed Jun. 10, 1977, Ser. No. 805,434

Int. Cl.[2] F16H *27/02*

U.S. Cl. 74—89.15 6 Claims



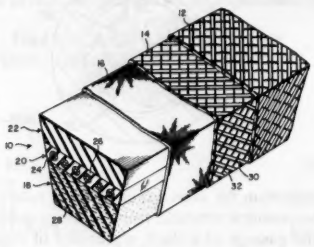
1. In the combination of a gimballed coupling and a lead screw and nut assembly, the lead screw and nut assembly comprising a lead screw and a nut threadedly mounted on the lead screw, said lead screw being adapted to be driven for imparting motion to the nut axially of the lead screw, the gimballed coupling comprising a housing captivating said nut, a transfer plate, a thrust bearing assembly carried by the transfer plate, first and second bearing members disposed between

the nut and the thrust bearing assembly, said first bearing member engaging said housing, said second bearing member engaging said thrust bearing assembly, said first and second bearing members having cooperative generally spherical surfaces, means carried by the transfer plate and the housing for yieldably urging the housing towards the transfer plate so that the first and second bearing members have their cooperative spherical surfaces in engagement with each other and means for preventing rotation of said housing with respect to said transfer plate.

4,131,030
COVERING FOR POWER TRANSMISSION BELT

Jack D. White, Jr., Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 2, 1977, Ser. No. 847,964
Int. Cl.[2] F16G *5/08, 5/12*
U.S. Cl. 74—232 **6 Claims**

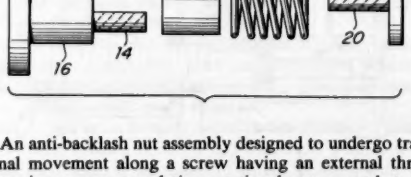


1. An endless power transmission belt having a trapezoidal cross-section comprising a belt body, two cord fabric cover layers, and a layer of woven fabric located between said belt body and said cord fabric cover layers; said cord fabric comprising strength cords extending at an angle to the longitudinal axis of the belt, and weak tie strands holding said strength cords in parallel position, the strength cords of one cord fabric cover layer extending at substantially opposite angles to the strength cords of the other cord fabric cover layer.

4,131,031
ANTI-BACKLASH NUT ASSEMBLY

Kenneth W. Erikson, Merrimack, and Keith W. Erikson, Nashua, both of N.H., assignors to Kerk Motion Products, Inc., Nashua, N.H.

Filed Jul. 19, 1977, Ser. No. 816,984
Int. Cl.[2] F16H *55/18, 1/18, 55/22;* **B21D** *53/28*
U.S. Cl. 74—441 **8 Claims**



1. An anti-backlash nut assembly designed to undergo translational movement along a screw having an external thread thereon in response to relative rotational movement between the nut assembly and screw, comprising, in combination:

a. a first portion of an axially-split nut having an internal thread complementary to the external thread of said screw;

b. a second portion of said axially-split nut, said second portion also having an internal thread complementary to the external thread of said screw;

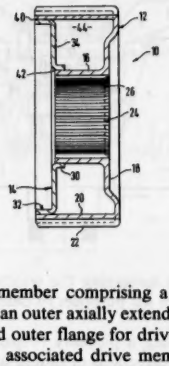
c. means for retaining said first portion and said second portion of the axially-split nut in an aligned position around said screw whereby their internal threads engage the external threads of said screw; and,

d. means for biasing said first portion and said second portion of the axially-split nut in opposite longitudinal directions.

4,131,032
ROTARY DRIVE MEMBER

George W. Warland, Surbiton, and Norman F. Crisp, Bookham, both of England, assignors to Borg-Warner Limited, Letchworth, England

Filed Jun. 2, 1977, Ser. No. 802,841
Int. Cl.[2] F16H *55/12, 55/30;* **B21D** *53/28*
U.S. Cl. 74—449 **13 Claims**

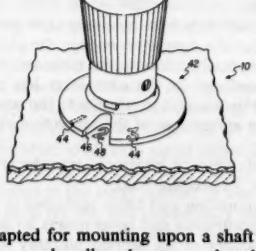


1. A rotary drive member comprising a cup-shaped sheet metal member having an outer axially extending flange, a series of teeth formed in said outer flange for driving relationship of said member with an associated drive member, a first radial portion extending inwardly from one axial end of said outer axially extending flange and a second sheet metal radial portion extending inwardly from the other axial end of said outer axially extending flange and an inner flange portion forming a hub of said drive member, and connected to said first and second radial portion, wherein a lightweight, high-strength box-shaped annular sheet metal rotary member is provided.

4,131,033
PUSH-PULL AND ROTATING KNOB

Norman Z. Wright, Marion, and Davey L. Printy, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 18, 1977, Ser. No. 769,979
Int. Cl.[2] G05G *1/10*
U.S. Cl. 74—553 **8 Claims**



1. A knob adapted for mounting upon a shaft of a control device presenting push-pull and rotary selectable functions upon an associated panel of the type having indicia through which light may pass from a light source behind said panel for enabling night viewing, located at rotationally selectable positions, comprising:

a skirt slideably positionable on said shaft adjacent said panel

to cover said indicia, said skirt having a window portion for disclosing selected indicia;

said skirt being located over said indicia to restrict them from view over an angle away from an axis along said shaft;

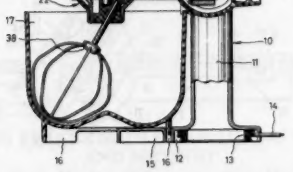
a plurality of arms attached to said skirt parallel to said shaft;

and an overlying knob attachable to said shaft, including therein longitudinal channel walls for axially slideably receiving said arms to facilitate the push-pull function selection and for engaging said arms when said overlying knob is rotated to rotate said skirt, said angle over which said indicia can be viewed being unaffected by by push-pull and rotation operations of said overlying knob.

4,131,034
ELECTROMOTIVELY DRIVEN DRIVE EQUIPMENT, ESPECIALLY FOR KITCHEN APPLIANCES OR THE LIKE

Mayer Rolf, Giengen, Germany, assignor to Bosch-Siemens Hausgerate GmbH, Stuttgart, Germany

Filed Nov. 16, 1976, Ser. No. 742,255
Claims priority, application Fed. Rep. of Germany, Nov. 19, 1975, 2551842
Int. Cl.[2] F16H *1/30*; B01F *7/00*
U.S. Cl. 74—799 **9 Claims**



1. Electromotively driven drive unit with a planetary gearing having bevel-gear toothing and including a revolving planet gear having an inclined axis intersecting with the axis of a central gear of the planetary gearing, and a gear box for the planetary gearing having a plurality of journal shafts to which tools and devices drivable with varying rotary speeds are connectible, the improvement therein comprising an internally toothed outer ring gear disposed concentrically to the central gear of the planetary gearing, the planet gear being in meshing engagement both with the teeth of the central gear and the teeth of said ring gear, the plane gear with a pin formed thereon being seated in a bearing member rotatably disposed on the axis of the central gear, the planet gear moving together with said bearing member during a whirling movement thereof about the central gear, whereby said bearing member rotates at a slower rotary speed than said central gear.

4,131,035
HYDROMECHANICAL TRANSMISSION

Kiyohumi Mizuno, Nagoya; Hiroaki Maeda, Toyota; Shigeo Takahashi, Chiryu, and Tsukasa Watanabe, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Apr. 21, 1977, Ser. No. 789,739
Claims priority, application Japan, Apr. 23, 1976, 51-46752
Int. Cl.[2] B60K *41/04*
U.S. Cl. 74—866 **7 Claims**

1. A hydromechanical transmission comprising:

an input shaft;

an output shaft;

a hydraulically controlled differential gear unit for selectively providing low and high speed drive power trains between said input and output shafts;

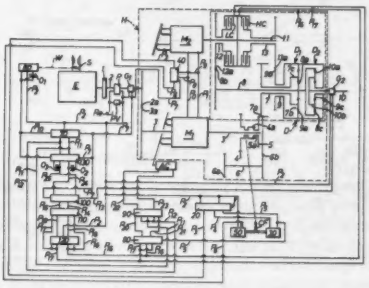
a first positive displacement pump-motor drivingly connected to said input or output shaft;

a second positive displacement pump-motor hydraulically connected with said first pump-motor;

a fluid actuator for controlling the displacement ratio of said first or second pump-motor;

a response valve for controlling line pressure applied to said actuator from a fluid pressure source in accordance with a difference in value between a first signal responsive to a throttle opening angle and a second signal responsive to the rotation speed of said input shaft;

low and high range clutch means operated by the line pressure from said fluid pressure source for switching-over



said low speed drive power train to and from said high speed drive power train in response to variation of an actual speed ratio of said output shaft against said input shaft;

speed ratio detecting means for generating a signal therefrom when the actual speed ratio becomes a predetermined value;

clutch control means for selectively operating said low and high range clutch means in response to the signal from said speed ratio detecting means; and

means for conducting the operation of said clutch control means such that said low and high range clutch means are selectively operated only when said difference in value between said first and second signals becomes a predetermined value.

4,131,036
METHOD AND APPARATUS FOR TRANSMISSION CONTROL SYSTEM

John S. Ivey, Bloomfield Hills, Mich., and Alan L. Miller, Mount Prospect, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 10, 1977, Ser. No. 805,363
Int. Cl.[2] B60K *41/18*
U.S. Cl. 74—866 **14 Claims**

1. An electronic control system for regulating change of gear ratio in an automatic transmission which has input and output mechanical driving connections, a first and second controllable friction elements connected for actuation by a change in fluid pressure applied thereto comprising:

a transducer, positioned to sense the torque at the transmission output driving connection and to provide an electrical signal which varies as a function of the output torque;

a first control valve, coupled to a supply fluid line for regulating the fluid pressure at the first friction element;

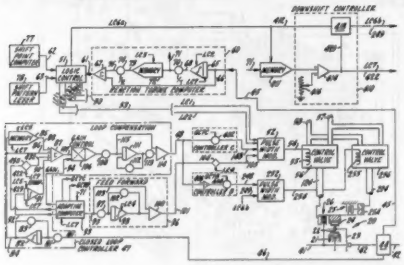
a second control valve, coupled to the fluid supply line for regulating the fluid pressure at the second friction element;

first and second pulse width modulation circuits, respectively coupled to the first and second control valves, for

providing control signals to regulate operation of the valves;

a closed loop controller, coupled between the transducer and the pulse width modulation circuits, including means to provide an output shaft torque downshift ramp in response to a downshift signal and to receive the output torque signal as a feedback signal and provide an error signal with respect to said ramp for regulating operation of the first and second pulse width modulation circuits as a function of the error signal;

said error signal being plus or minus and means in the circuit between said closed loop controller and said second pulse width modulation circuit to invert said signal whereby said first and second pulse width modulation circuits react oppositely to said error signal so that said friction elements are controlled in a way to have the output shaft torque follow said downshift ramp.



12. The method of regulating gear ratio change by control of two engageable devices in a gear set coupled between an automotive engine and an output drive, comprising the steps of:

sensing the output torque provided by the gear set;

providing a feedback signal which varies as a function of the output torque;

establishing a reference torque ramp signal;

continually comparing the feedback signal with the torque ramp signal to develop an error signal throughout the gear ratio change;

providing actuation means responsive to the error signal to control the engageable devices; and

having said actuation means and said engageable devices arranged such that one of said devices is actuated toward engagement and the other toward disengagement in response to said error signal whereby said output shaft torque will follow said torque ramp during said shift.

4,131,037

ADJUSTABLE INTERLOCK HAND LEVER

Roger F. Olsen, Cuyahoga Falls, and George Cantley, Akron, both of Ohio, assignors to Incom International Inc., Pittsburgh, Pa.

Filed Jul. 29, 1977, Ser. No. 820,490

Int. Cl.[2] B60K *41/04*; G05G *5/10, 11/00, 1/00*

U.S. Cl. 74—876 **27 Claims**

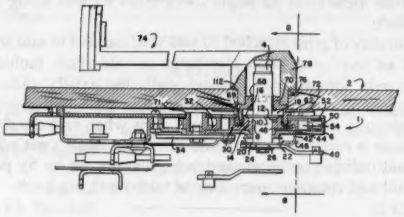
12. Adjustable interlock apparatus for a control unit having a shaft rotatably supported in and axially translatable with respect to a housing comprising,

a collar disposed about the shaft and having a notch in an axially outward surface,

engaging means connected to the shaft and having an axially inward surface abutting the axially outward surface of the collar for preventing axial translation of the shaft toward the housing when the shaft is rotated from a selected interlock position,

the engaging means further configured to engage the notch when the shaft is rotated to the selected interlock position thereby permitting axial translation of the shaft toward the housing,

and retaining means connected to the housing and collar for securing the collar in a rotational orientation selected to



permit engagement of the notch and engaging means when the shaft is rotated to the interlock position.

4,131,038

GUIDE DEVICE FOR SHARPENING SAWS

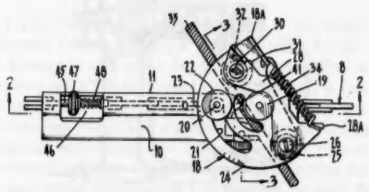
Cornelis J. Beerens, 16 Anchorage St., Merville Village, Paranaque, Rizal, Philippines

Filed Jul. 8, 1977, Ser. No. 813,848

Claims priority, application Australia, Jul. 8, 1976, 6582/76

Int. Cl.[2] B23D *63/10*

U.S. Cl. 76—25 A **8 Claims**



1. A file guide device for use in sharpening the teeth of a saw having a saw plane comprising a support member adapted to be attached to a saw in a predetermined relation to the teeth of the saw, a pair of parallel rollers each having a peripheral surface and being mounted for rotation in a roller rotation plane on a respective axis, said rollers being carried by the support member, the peripheral surface of each roller defining a seat for a file to be used to sharpen the saw teeth, said roller rotation plane and the axes of the rollers being arranged so that, upon the support member being attached to the saw, the axis of a file seated in the seats of the rollers has an inclination to the saw plane substantially equal to the angle of the cutting edge of a saw tooth, at least one of said rollers being mounted on an independent member, said independent member being supported for limited movement relative to the support member to effect movement of the file axis toward or away from the cutting edge of said saw tooth when the support member is attached to the saw, and means operable for urging the independent member to move in a direction to move the file axis toward said cutting edge.

4,131,039

TIGHTENING FORCE LIMITING DEVICE

Michel J. Garconnet, 22 rue du Docteur Vitet, Saint Nicolas d'Aliermont, France

Filed Feb. 2, 1977, Ser. No. 764,948

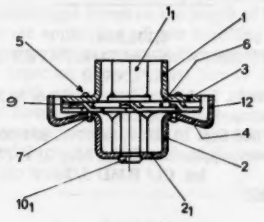
Claims priority, application France, Feb. 3, 1976, 76 02985

Int. Cl.[2] B25B *23/14*

U.S. Cl. 81—52.4 R **6 Claims**

1. A device for limiting tightening force comprising a pair of end fitting bodies, one of said end fitting bodies being adapted to connect to a tightening member and the other of said end

fitting bodies being adapted to connect to a member to be tightened, a first disc having a plurality of slots, said first disc being fixedly connected to one of said end fitting bodies, a second disc of resilient material being fixedly secured to the other of said end fitting bodies, a plurality of inclined tongues extending from said second disc, said two discs being arranged



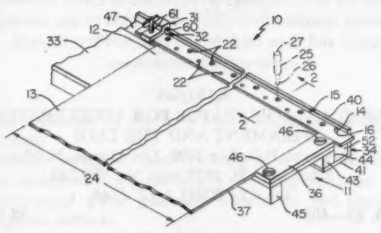
coaxial to one another and each of the tongues of said second disc being received within one of the slots of said first disc for transmitting the tightening force between said end fitting bodies, said tongues being adapted to move out of said slots when the rotational force in one rotational direction exceeds a given value, and an assembly pin connected to one of said bodies, said pin extending through a central hole in said discs.

4,131,040

PRINTING BLANKET HOLE FORMING APPARATUS AND METHOD

Jacob A. Bollmer, Dayton, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 14, 1977, Ser. No. 851,091
Int. Cl.[2] B26F *1/32*
U.S. Cl. 83—50 **15 Claims**



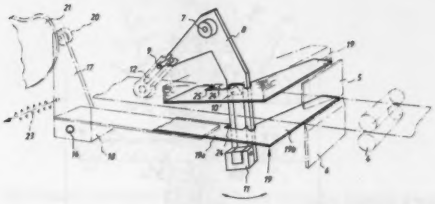
13. A method of forming holes in a printing blanket comprising the steps of, supporting an end portion of a blanket on a support, fixing a locating pin to one end of said support, providing a template having at least one template locating hole therein and a set of openings therein associated with said one hole, positioning said template by disposing said locating hole thereof around said pin with an end portion of a blanket supported on said support, clamping said template against said blanket and support at a location remote from said locating hole, and forming holes in said blanket as determined by said openings employing an associated hole forming device by extending said device first through the openings in said template and then through said blanket to form corresponding holes in said blanket.

4,131,041

COLLECTOR FORMING AN ACCUMULATING STACK FROM SUCCESSIVELY RECEIVED SEVERED SECTIONS OF PHOTOGRAPHIC STRIP

Heinz Lüdemann, Münich; Harald Fengler, Taufkirchen, and Ferdinand Schaner, Münich, all of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Sep. 6, 1977, Ser. No. 830,446
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1976, 2640478
Int. Cl.[2] B65H *31/24*
U.S. Cl. 83—94 **17 Claims**



1. In an apparatus for processing a long photographic strip, in combination, means for transporting the long photographic strip along a predetermined path; cutting means located along the path and operative for severing the successive leading end sections of the strip from the remainder of the strip to successively form severed strip sections; and collecting means operative for receiving the successively formed severed strip sections in succession and forming an accumulating stack of such sections, including holding means operative for holding the successively received strip sections in position in the accumulating stack individually, the holding means comprising a succession of individually activatable holding units, and means for activating successive ones of the succession of holding units in synchronism with the receipt of successive severed strip sections by the collecting means, the succession of individually activatable holding units comprising a stack of holding plates, the means for activating the successive ones of the holding units comprising means for laying successive ones of the holding plates upon respective successively received ones of the strip sections received by the collecting means and causing each holding plate laid upon a received strip section to exert a holding force upon the respective strip section.

4,131,042

APPARATUS FOR CUTTING AND REMOVING DRY FILM PHOTORESIST FROM PRINTED WIRE BOARDS

Dennis E. Rich, Riverton, Utah, and Conrad J. Steigerwald, Phoenix, Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Dec. 27, 1977, Ser. No. 864,562
Int. Cl.[2] B26F *1/02*; B21D *45/02*
U.S. Cl. 83—100 **10 Claims**

1. Apparatus for cutting and removing from a laminated board having a base, with an opening through the base, segments of the outer laminations overlaying said opening, comprising:

a base plate having an upper planar surface;

a lower cutter having a cutting edge, said cutting edge substantially defining a lower cutter plane;

means for mounting the lower cutter on the base plate so that the lower cutter plane projects above the planar surface of the base plate a predetermined distance;

a lower plunger having a top surface mounted for movement within said lower cutter, said lower plunger having an extended position and a retracted position;

a cutter head mounted on the base plate at a substantially fixed distance above the upper surface of the base plate;

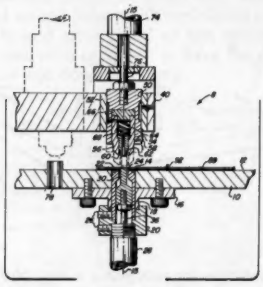
an upper cutter having a cutting edge, said cutting edge of the upper cutter defining an upper cutter plane;

means for mounting said upper cutter on said cutter head for linear reciprocal movement between a retracted positon and an extended position in which the upper cutter plane is spaced a predetermined distance from the lower cutter plane;

an upper plunger having a lower surface mounted for linear movement in said upper cutter;

bias means for biasing said upper plunger toward said base;

cutter actuator means for moving the upper cutter from its retracted to its extended position;



plunger actuator means for causing said lower plunger to move from its retracted to its extended position, the top surface of said lower plunger being capable of contacting the lower surface of the upper plunger when the upper cutter and the lower plunger are in their extended positions; and

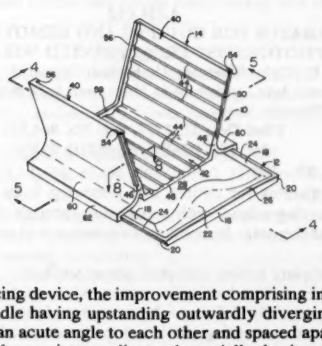
conduit means formed in said upper cutter, said conduit means adapted to be connected to a source of vacuum to cause material severed by said cutters to adhere to the upper plunger.

4,131,043

FOOD-SLICING DEVICE

Benjamin W. Colman, 8616 Nadine Ave., Huntington Woods, Mich. 48070, and Montgomery Ferar, Huntington Woods, Mich., assignors to Benjamin W. Colman, Huntington Woods, Mich.

Filed Nov. 10, 1976, Ser. No. 740,732
Int. Cl.² B26D *4/42*
U.S. Cl. 83—167 **17 Claims**



1. In a slicing device, the improvement comprising in combination a cradle having upstanding outwardly diverging walls disposed at an acute angle to each other and spaced apart from each other by an intermediate substantially horizontal web section therebetween of substantial width connected to said walls and adapted to receive and support thereon a product to be sliced,

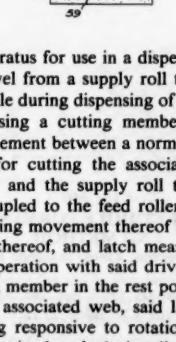
said walls and web section being commensurate with and of a length sufficient to support said product thereon, and an anvil tray having a generally planar area adapted to receive and support the slices cut from said product, associatedly conjoined to said cradle, extending forwardly thereof in a plane below the product-supporting plane of said intermediate web section, and adapted to receive the cutting edge of a blade slicing the portion of said product extending beyond the forward edges of said cradle walls and web section.

4,131,044

CUT-OFF MECHANISM FOR PAPER TOWEL DISPENSER

Antonio M. Cassia, La Milan, Italy, assignor to Steiner American Corporation, Salt Lake City, Utah

Filed Sep. 19, 1977, Ser. No. 834,404
Claims priority, application Italy, May 2, 1977, 49217 A/77
Int. Cl.² B26D *5/26*
U.S. Cl. 83—205 **19 Claims**



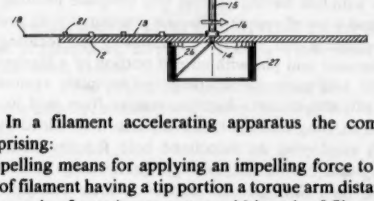
1. Cutting apparatus for use in a dispenser for dispensing a web of paper towel from a supply roll thereof and having a feed roller rotatable during dispensing of the web, said cutting apparatus comprising a cutting member mountable on the dispenser for movement between a normal rest position and a cutting position for cutting the associated web between a dispensed portion and the supply roll thereof, drive means adapted to be coupled to the feed roller and to said cutting member for effecting movement thereof between the rest and cutting positions thereof, and latch means mountable on the dispenser for cooperation with said drive means normally to retain said cutting member in the rest position thereof during dispensing of the associated web, said latch means and said drive means being responsive to rotation of the feed roller through a predetermined angle during dispensing of the associated web for actuating said drive means to effect movement of said cutting member from the rest position to the cutting position thereof and then back to the rest position thereof.

4,131,045

METHOD AND APPARATUS FOR ACCELERATING A FILAMENT AND THE LIKE

Dennis R. Peterson, P.O. Box 1090, Los Alamos, N. Mex. 87544

Filed Apr. 20, 1977, Ser. No. 789,352
Int. Cl.² B26D *1/12, 1/48*
U.S. Cl. 83—403 **18 Claims**



1. In a filament accelerating apparatus the combination comprising:

impelling means for applying an impelling force to a length of filament having a tip portion a torque arm distance from an axis of rotation to rotate said length of filament about

said axis of rotation to develop a selected tip speed in said tip portion; and

means providing for the controlled advancement of said length of filament along its longitudinal axis toward said tip portion during the application of said impelling force, said length of filament being the end section of a supply of filament movable toward said tip portion under the influence of centrifugal forces on the length of filament resulting from the application of said impelling forces and including supporting means including surfaces disposed at a location departing from a radial line of the torque arm movable with said impelling means against which said length of filament moves during advancement for reducing the tension in said length of filament caused by the centrifugal forces on said length of filament for increased filament tip speed.

4,131,046
APPARATUS FOR SEVERING A WEB

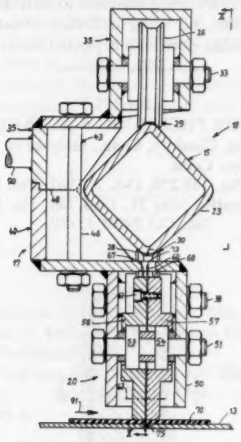
Willi Strohmeyer, Grimsehlstrasse 37, D 3352 Einbeck, Fed. Rep. of Germany

Filed Oct. 27, 1977, Ser. No. 847,915

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650355

Int. Cl.[2] B23D *19/00;* B26D *1/18*

U.S. Cl. 83—471.2 **10 Claims**



1. An apparatus for cutting a web workpiece, said apparatus comprising:

a support having an upper flat support surface formed with an elongated slot extending in a cutting direction;

an elongated guide generally parallel to and above said support surface;

a carriage longitudinally displaceable along said guide;

bearing means is said carriage defining therein an axis substantially perpendicular to said direction and non-displaceable in said carriage;

a wheel rotatable in said carriage about said axis and having an outer periphery centered on said axis and engageable through a web workpiece lying on said surface with said surface;

mounting means supporting at least said carriage, said bearing means and said wheel on said support surface with said periphery, whereby said carriage, said bearing means and said wheel bear with their joint weight on said surface or on a web workpiece lying thereon through said periphery; and

a cutter disc fixed to and jointly rotatable with said wheel and lying in a plane parallel to said direction and substantially perpendicular to said axis, said disc having a cutting edge centered on said axis and extending radially beyond said periphery into said slot.

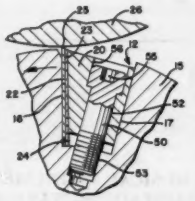
4,131,047
ROTARY KNIFE MOUNTING

Louis Schriber, and John F. Blaha, both of Dayton, Ohio, assignors to Harris Corporation, Cleveland, Ohio

Filed Mar. 28, 1977, Ser. No. 781,838

Int. Cl.[2] B26D *1/40, 4/72*

U.S. Cl. 83—698 **5 Claims**



1. In a rotary cutter including a cutter cylinder having a web engaging surface portion and a longitudinal slot adapted to receive a knife,

a knife located in said slot and having a cutting edge extending out of said slot beyond said surface portion, said knife having a width less than the depth of said slot whereby the edge of said knife opposite said cutting edge is spaced from the bottom of said slot,

a wedge bar within said slot adapted to exert a force holding said knife against a side of said slot,

preloading means acting on said wedge bar to retain said knife in said slot with a force sufficient to hold said knife against manual movement but which may be overcome during seating of said knife against an anvil,

release means acting to move said bar outwardly of said slot against the force of said preloading means for insertion or removal of said knife, and

clamping means acting on said bar additive to said preloading means to clamp the knife to said cylinder after the knife is seated.

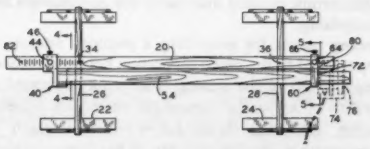
4,131,048
WORKPIECE AND WORK TOOL CUTTING JIG

Roger D. Dickes, 15415 Lima Rd., Huntertown, Ind. 46748

Filed Jul. 27, 1977, Ser. No. 819,299

Int. Cl.[2] B27B *11/04*

U.S. Cl. 83—745 **1 Claim**



1. Jig apparatus comprising an elongate reference beam; a reference stop longitudinally adjustably mounted on said beam and having a laterally extending member for receiving and providing a reference surface for longitudinally positioning one end of a workpiece;

first means for releasably holding said stop on said beam;

a reference guide longitudinally adjustably mounted on said beam and having a laterally extending surface overlying the workpiece for guiding a work tool in reference to the workpiece;

second means for releasably holding said stop on said beam;

said stop has an opening for slidably receiving said beam and through which said beam extends;

said stop reference surface being vertical and engageable by the one end of the workpiece for longitudinal positioning of the workpiece;

said stop having a laterally extending horizontal surface underlying said workpiece for vertically supporting said workpiece;

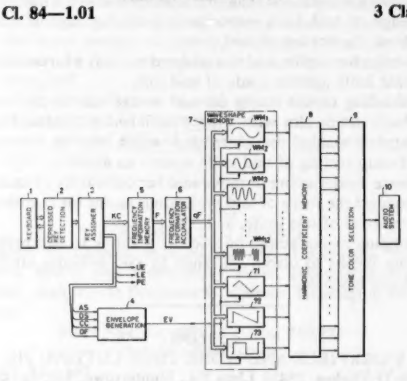
said stop having a vertical longitudinally aligned surface for laterally positioning a side of said workpiece.

4,131,049

ELECTRONIC MUSICAL INSTRUMENT HAVING MEMORIES CONTAINING WAVESHAPES OF DIFFERENT TYPE

Takatoshi Okumura, and Shimaji Okamoto, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 5, 1976, Ser. No. 729,690
Claims priority, application Japan, Oct. 6, 1975, 50-120519
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **3 Claims**



1. An electronic musical instrument for generating a musical tone, comprising:

addressing means for providing a memory address signal proportional to the phase separation between consecutive sample points of the musical tone being generated;

a plurality of sinusoidal waveshape memories respectively storing individual sinusoidal waveshapes each corresponding to a specific number of harmonic components and being read by said memory address signal from said addressing means;

at least one complex waveshape memory each storing a complex waveshape containing abundant harmonic components and each being read by said memory address signal from said addressing means; and

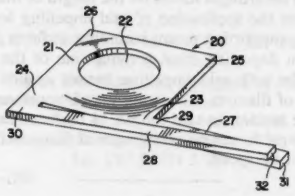
a circuit for suitably mixing the respective waveshapes read from said sinusoidal waveshape memories and said at least one complex waveshape memory for producing said musical tone, said circuit including scaling networks for individually scaling the outputs of each of said sinusoidal and complex waveshape memories so as to produce a desired tone color.

4,131,050

VISUAL LOAD INDICATOR

Peter C. Holmes, Gates Mills, Ohio, assignor to The Solon Manufacturing Company, Chardon, Ohio

Filed Jul. 5, 1977, Ser. No. 812,691
Int. Cl.[2] F16B *31/02*
U.S. Cl. 85—62 **15 Claims**



1. A load indicator which comprises:

a single compressible spring washer portion capable of deflection when compressed;

a first lever attached to the washer portion and axially deflected as the washer portion is compressed; and

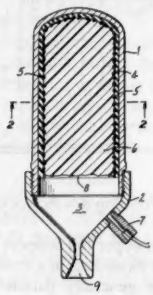
a second lever attached to the washer portion and axially deflected as the washer portion is compressed; the first and second levers being attached to different parts of the washer portion and being deflected toward each other when the washer portion is deflected under compression.

4,131,051

PROCESS FOR PREPARING A ROCKET MOTOR

Otto G. Schaffling, Cheshire, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 143,275, Oct. 2, 1961, Pat. No. 3,965,676.
This application May 21, 1964, Ser. No. 373,126
Int. Cl.[2] F42B *33/10*
U.S. Cl. 86—1 R **9 Claims**

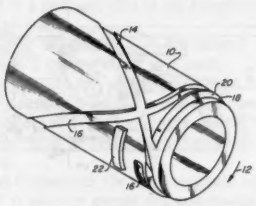


1. In the process for preparing a rocket motor, the improvement which comprises applying a layer of an uncured organic material capable of being cured to a rubbery material, to the interior combustion chamber wall of a rocket vessel, partially embedding powder grains in the exposed surface of said uncured material before solidification, thereafter curing and solidifying said uncured material, whereby a rubberbase liner is formed having one surface firmly adherng to said wall and said powder grains firmly adhering to the exposed surfaces of said liner with a portion of each powder grain protruding from said liner, filling the lined portion of the chamber with a thermoplastic propellant charge, and solidifying said propellant charge, whereby a firmly adhering bond is formed between the solidified propellant charge, the powder grains and the solidified liner.

4,131,052
DRUM CAM WITH ANTI HANG-FIRE FEATURE

Fred J. Skahill, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 5, 1977, Ser. No. 812,878
Int. Cl.[2] F41D 7/02
U.S. Cl. 89—11 6 Claims



1. A drum cam with anti hang-fire feature, in combination with the operating group of an externally powered automatic weapon, said cam comprising:

a drum having a first diagonal groove for moving said operating group forward to in-battery position when a cam follower on said group is positioned in said first groove and said drum is rotating,

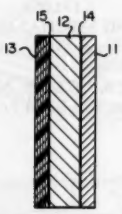
said drum having a second diagonal groove for moving said operating group rearward to recoil position when a cam follower on said group is positioned in said second groove and said drum is rotating, and

means responsive to the recoil of said operating group after firing of a cartridge for moving said cam follower into said second groove.

4,131,053
ARMOR PLATE

Wilfred J. Ferguson, Hillcrest Heights, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1965, Ser. No. 484,789
Int. Cl.[2] F41H 5/04
U.S. Cl. 89—36 A 4 Claims



1. An armor capable of fragmenting projectiles and protecting against fragments which comprises:

first, second and third layers of different armor material secured together by a bonding material,

said first layer is formed of a hard face, low density material,

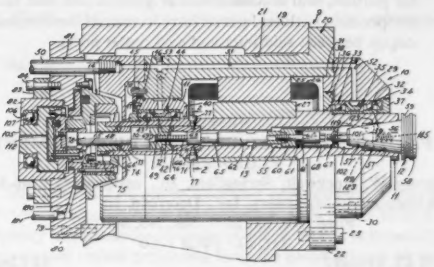
said second layer is formed of a material having a low density and high young's modulus with a greater ductility than said hard face first layer with a thickness greater than said first and said third layer, and

said third layer is formed of a resin reinforced with high strength fibers.

4,131,054
HIGH SPEED SPINDLE AND DRAW BAR ASSEMBLY

Charles R. Johnson, Howell; John K. Forlow, Wixom; Paul G. Black, Whitmore Lake, all of Mich.; William A. Mitchell, and John S. Clark, both of Springfield, Vt., assignors to Ex-Cell-O Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 739,417, Nov. 8, 1976, abandoned. This application Feb. 9, 1977, Ser. No. 767,013
Int. Cl.[2] B23C 5/26
U.S. Cl. 90—11 D 19 Claims



1. In a machine tool having a rotary hollow spindle shaft with a draw bar assembly including a tool holder gripping means mounted in said spindle shaft for axial movement with respect thereto, between an operative position for retaining a tool holder or the like in said spindle shaft, and an inoperative position to permit a tool holder or the like to be removed from or inserted into the spindle shaft, the combination comprising:

(a) actuator means for moving said draw bar assembly between said operative and inoperative positions;

(b) spindle shaft holding means for holding the spindle shaft stationary when the draw bar assembly is moved between said operative and inoperative positions;

(c) a drive motor;

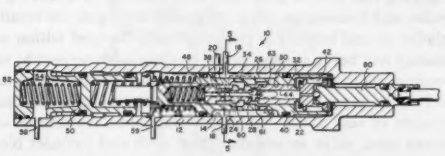
(d) means for selectively connecting and disconnecting said drive motor and said draw bar assembly; and

(d) indicator means operatively connected to said drive motor for indicating an inoperative tool holder gripping means and a no-tool holder condition.

4,131,055
NOISE REDUCING CONTROL VALVE FOR A HYDRAULIC BRAKE BOOSTER

Louis R. Erwin, Livonia, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Feb. 3, 1977, Ser. No. 765,322
Int. Cl.[2] F15B 9/10; F16K 47/00; F16L 55/02
U.S. Cl. 91—378 10 Claims



1. A control valve for a hydraulic booster comprising:

a housing having a bore therein and inlet and outlet ports communicating with the bore;

a piston slidably mounted in said bore, said piston having a bore therein communicating with the inlet port and the outlet port through openings on the piston, said piston forming a pressure chamber with the housing bore and cooperating with means for actuating a brake application upon movement of said piston within the housing bore;

a valve member slidably mounted within said piston bore, said valve member being movable within said piston bore

upon a brake application to restrict the communication between said inlet and outlet ports and to open the communication between said inlet port and the pressure chamber to move said piston within said housing bore;

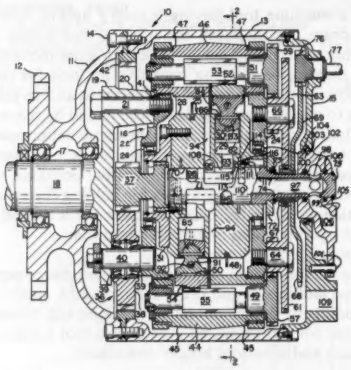
said valve member including a land cooperating with said piston bore to restrict the communication between said inlet and outlet ports, said land including a first diameter portion, a second diameter portion and a recess between the first and second diameter portions, said first diameter portion having a larger diameter than said second diameter portion, said second diameter portion and said recess cooperating with said piston bore to restrict the communication between said inlet and said outlet ports.

4,131,056

PILOT CONTROLLED VARIABLE DISPLACEMENT FLUID MOTOR

Harvey W. Rockwell, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 15, 1977, Ser. No. 860,989
Int. Cl.[2] F01B *1/06*
U.S. Cl. 91—492 **12 Claims**



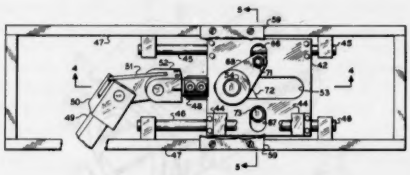
1. A combination fluid motor and drive unit comprising, in combination, an exterior housing member, a power output member having a portion extending through a part of said housing and journalled for rotation relative to said housing, said drive member including means for supporting at least one output driven gear, at least one output driven gear received on a portion of said power output member and mounted for rotation relative thereto, an output drive gear having portions engaging said driven gear, means positioning said drive gear within said housing and supporting said drive gear for rotation relative to said housing, a cylinder block disposed within said housing and being supported for rotation with respect to said housing, a drive connection between said cylinder block and said drive gear, means engaging said driven gear to cause rotation of said power output member upon rotation of said driven gear, valve means associated with said cylinder block for directing fluid under pressure into said cylinders, a plurality of piston and slipper assemblies each having a portion received within one of the cylinders in said block, at least one torque reaction receiving ring surrounding said piston and cylinder units, said torque reaction receiving ring including an inwardly directed cylindrical raceway for said slipper assemblies, said ring being movable among a plurality of positions including positions of both offset and concentric disposition with respect to said cylinder block to change the torque and directional operating characteristics of said cylinder block, and control means for positioning said ring in a desired one of said plurality of positions.

4,131,057

APPARATUS FOR FORMING A CONVOLUTED CONTAINER SIDEWALL

Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 29, 1976, Ser. No. 727,910
Int. Cl.[2] B31B *1/32*
U.S. Cl. 93—81 R **14 Claims**



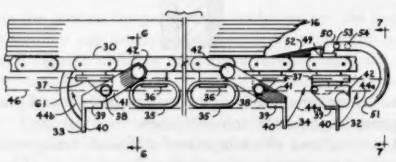
1. Apparatus for wrapping a blank about a mandrel, with the mandrel being in a blank wrapping position, to form a convoluted tubular sidewall, which comprises a mandrel; a clamping means associated with said mandrel to hold an intermediate portion of a blank therebetween; first and second folding wing means; each of said first and second folding wing means having a frame, a wiping blade and means for resiliently mounting the wiping blade in the frame for movement of the blade along a line radial to the longitudinal axis of said mandrel when said mandrel is in the blank wrapping position; said first and second folding wing means being positioned for the wiping blades to contact the outer surface of the thus held blank on opposite sides of said clamping means; means for rotating each of said first and second folding wing means about the longitudinal axis of said mandrel in the blank wrapping position in an at least substantially constant distance from the longitudinal axis of said mandrel to wrap the blank about said mandrel with one side margin of said blank overlapping the opposite side margin of said blank; and means for sealing the thus overlapped side margins to thereby form a convoluted tubular sidewall; one of said wiping blades having a generally L-shaped configuration with one leg of the L-shaped wiping blade forming the surface which contacts said blank, said one leg extending forwardly in the direction of movement of said L-shaped wiping blade during the wrapping of said blank about said mandrel to lead the forward edge of the other of said wiper blades to cause the side margin of said blank contacted by said L-shaped wiping blade to fold inwardly under the opposite side margin of said blank contacted by the other of said wiper blades.

4,131,058

END TAB FOLDING MECHANISM FOR CARTONS

Robert H. Graham, Spokane, Wash., assignor to R. A. Pearson Company, Spokane, Wash.

Filed Oct. 6, 1977, Ser. No. 839,884
Int. Cl.[2] B31B *1/26*
U.S. Cl. 93—49 R **11 Claims**



1. A mechanism for completing the folding of a carton having:

a) oppositely facing front and back end walls spaced longitudinally from one another;

b) a third wall having opposite longitudinal ends overlapping the separation between corresponding transverse edges of the first and second end walls; and

c) first and second foldable tabs formed integrally across the third wall at the respective longitudinal ends thereof, said tabs overlying and projecting outward beyond the respective front and back end walls for foldable engagement with the respective exterior surfaces thereof;

said mechanism comprising:

a framework;

guide means on said framework for supporting a carton for movement in a path parallel to the longitudinal dimension of said third wall;

carton engaging means on said framework for imparting movement to a carton along said path;

conveyor means movably mounted on said framework and located adjacent said guide means and having a working flight extending between opposite infeed and discharge ends thereof; said working flight being arranged parallel to said path;

means on said framework for powering said carton engaging means and conveyor means for continuous synchronous movement of a carton along said path while traversing the flight of said conveyor means;

said conveyor means comprising:

a) first transversely oriented tab folding means on the conveyor working flight;

b) operating means on said framework located between the infeed and discharge ends of the working flight for engagement with said tab folding means for causing it to fold and maintain said first tab against the exterior surface of said front end wall as the carton is moved continuously along the working flight of said conveyor means by said carton engaging means; and

c) second transversely oriented tab folding means on the conveyor working flight and for folding and maintaining said second tab against the exterior surface of said back end wall as the carton is moved continuously along the working flight of said conveyor means by said carton engaging means.

4,131,059

APPARATUS FOR FORMING AND CONTROLLING CURRENTS OF AIR

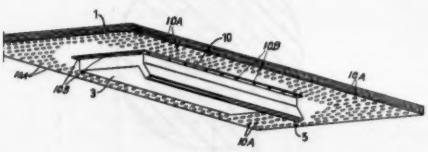
Lennart Gustavsson, Vaxjo, Sweden, assignor to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Mar. 2, 1977, Ser. No. 773,758

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1976, 2609030

Int. Cl.[2] F24F *9/00*

U.S. Cl. 98—36 **11 Claims**



1. Apparatus for forming and controlling currents of air in a region, comprising:

perforate partition means adjacent said region;

air-moving means on the opposite side of said partition means from said region for pressurizing air on said opposite side to force currents of air through said perforate partition means into said region; and

box-like air guiding means adjacent said region and covering a perforate portion of said partition means, for receiving said air currents and concentrating their flow in a particular part of said region, said air guiding means being open on one side to said perforate portion of said partition means to receive said air currents and sealed about its periphery to said partition means, said air guiding means comprising one or more restricted openings to said region and being open substantially only to said perforate portion of said partition means and at said restricted openings, thereby to form from said received air currents at least one curtain a higher-velocity air directed into said region.

4,131,060

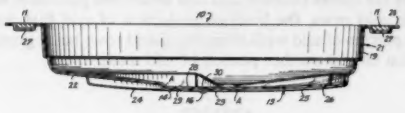
SELF-CLOSING EXHAUST FAN COVER

Merwin A. Caine, Jackson, N.J., assignor to The Crest Company, Jackson, N.J.

Filed May 6, 1977, Ser. No. 794,599

Int. Cl.[2] F04D *25/14*

U.S. Cl. 98—116 **10 Claims**



1. An exhaust fan cover assembly comprising a frame of sufficient size to cover a fan assembly, said frame having a periphery substantially defining a plane and a substantially dome-shaped region projecting from the plane defined by said periphery, said dome-shaped region having at least one, opening in a region thereof spaced from the apex of said dome-shaped region, and a resilient valve element secured to the inner surface of the dome-shaped region of said frame at a position proximate to said opening and on the side of said opening nearest to the apex of said dome-shaped region, said valve element being shaped to close completely said opening by tension against the inner surface of the dome-shaped portion of said frame at the periphery of said opening, each point on the periphery of said opening defining an angle less than 180° with the position at which said valve element is secured to tension said valve element against said frame.

4,131,061

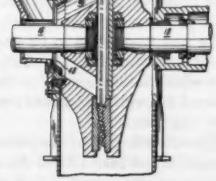
SYSTEM AND APPARATUS FOR MILLING CORN STARCH AND LIKE RAW MATERIALS

Lawrence Skeen, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Filed Jun. 1, 1976, Ser. No. 691,240

Int. Cl.[2] B02B *1/06*

U.S. Cl. 99—521 **13 Claims**



1. A refiner plate having an operating face comprising a base surface from which projects a plurality of teeth, a portion of said teeth being arranged in a spaced side by side relation to form rows thereof, each of which rows have a generally arcuate configuration, said rows being arranged in a spaced relation between an inner and an outermost edge of said base surface, another portion of said teeth comprising projections which lie between adjacent of said rows and extend substantially coextensive therewith as a single relatively unbroken projection

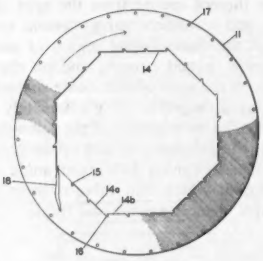
from said base surface, each of said relatively unbroken projections including surface portions facing the inner edge of said base surface to cause material moving over and adjacent said base surface which impact thereon to deflect outwardly from said surface, and at angles providing that they tend to approach the outermost edge of said base surface, said rows of teeth being arranged to dispose in a radially spaced relation and said projections which lie between adjacent of said rows and extend substantially coextensive therewith being arranged in radially spaced relation and interspersed among said rows of teeth to prohibit movement of materials the constituents of which are to be separated directly across said base surface in paths defined by the spaces between said first mentioned portion of said teeth in said rows, the level of projection of said first mentioned portion of said teeth comprising said rows being greater than that of said another portion of said teeth.

4,131,062

DECLUSTERER DEVICE

Ramakrishnarao K. Kumandan, Columbus, Wis., assignor to Hughes Company, Inc., Columbus, Wis.

Filed Sep. 9, 1977, Ser. No. 831,762
Int. Cl.[2] A23N *15/02;* A47J *21/00*
U.S. Cl. 99—638 **17 Claims**



1. A device for engaging and removing clusters of pod vegetables joined together by stem sections from a mass of such vegetables comprising:

(a) a substantially flat body having a thickness less than the length of the stem sections connecting the pod vegetables to form clusters,

(b) first and second substantially straight primary edges of the body having a projected point of intersection and defining an external angle of less than 180°, the first primary edge extending beyond the projected point of intersection of the primary edges in a continuous manner without change of direction,

(c) the second primary edge having a point of termination spaced from the projected point of intersection to define a gap between the primary edges sufficiently large to admit the stems of the pod vegetables to be engaged, the first primary edge further extending in a straight line beyond the point from which a line normal to the first primary edge would extend through the point of termination of the second primary edge, and

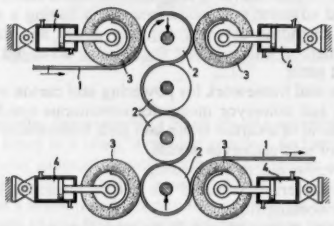
(d) a retaining edge extending from the point of termination at an internal angle of less than 180° to the second primary edge and intersecting the extended first primary edge in trailing relation to define a notch in the body between the extended first primary edge and the retaining edge, whereby as the body is drawn through a mass of pod vegetables with the first and second primary edges substantially upwardly facing the lower margin of the notch will be defined by the extended first primary edge to provide a completely open and unimpeded entry path such that the stems of pod clusters adjacent to the first primary edge may freely enter the notch along the substantially straight first primary edge without change of direction with respect to the first primary edge and be engaged by the retaining edge for removal from the mass.

4,131,063

CALENDER

Jukka Joutsjoki, Järvenpää, Finland, assignor to Oy Wartsila AB, Helsinki, Finland

Filed Oct. 13, 1977, Ser. No. 841,942
Claims priority, application Finland, Oct. 19, 1976, 762971
Int. Cl.[2] B30B *3/04*
U.S. Cl. 100—162 R **4 Claims**



1. A calender being defined by a plurality of superimposed hard rolls and a number of soft rolls arranged to laterally load at least two of said hard rolls, said soft rolls being arranged in pairs formed by two soft rolls opposite each other at both sides of the same hard roll, those of said rolls which are located between a pair of soft rolls being arranged so that the distance between their axes is greater than the sum of their respective radii.

4,131,064

TAGGING PARTICLES WHICH ARE EASILY DETECTED BY LUMINESCENT RESPONSE, OR MAGNETIC PICKUP, OR BOTH

Frederick M. Ryan, Loyalhanna Township, Westmoreland County, and Paul C. Handke, Plum Borough, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 15, 1977, Ser. No. 816,221
Int. Cl.[2] F42B *1/00*
U.S. Cl. 102—1 R **13 Claims**

1. Small individual particles for tagging of objects desired to be identified, said particles each comprising:

(a) luminescent material means which will provide readily detectable luminescent response upon exposure to excitation radiations of predetermined wavelength shorter than the luminescent response of said luminescent material means;

(b) other material means which will provide predetermined indicia of information once such other material means is located;

(c) small particles of magnetic material means which is reflective both for said excitation radiations for said luminescent material means and for said readily detectable luminescent response of said luminescent material means; and

(d) bonding means bonding together in small particle form said luminescent material means, said other material means and said reflective magnetic material means, and said bonding means transmissive both for said excitation radiations for said luminescent material means and for said readily detectable luminescent response of said luminescent material means; whereby said particles are recoverable by visual detection or by magnetic pickup or by both visual detection and magnetic pickup with substantially no absorption of radiations due to the inclusion of said magnetic material means in said particles.

6. In combination, an explosive device and associated tagging means which is readily recoverable either before or after said explosive device is detonated and which, after recovery, provides information about said explosive device, said tagging means comprising small individual conglomerates intimately associated with said explosive device and each comprising:

(a) finely divided inorganic luminescent material means which will provide readily detectable luminescent response upon excitation by ultraviolet radiations;

(b) finely divided other material means which will provide predetermined indicia of information about said explosive device once such other material means is located;

(c) small particles of magnetic material means which is reflective both for visible radiations and ultraviolet radiations; and

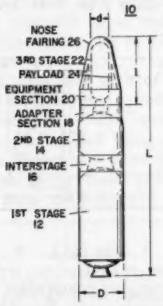
(d) binder material means binding together in small conglomerate form said inorganic luminescent material means, said other material means and said reflective magnetic material means, and said binder material means transmissive for ultraviolet radiations and also for the luminescent response of said ultraviolet-excited luminescent material means; whereby said conglomerates are recoverable by visual detection or by magnetic pickup or by both visual detection and magnetic pickup with substantially no absorption of radiations due to the inclusion of said magnetic material means in said conglomerates.

4,131,065

MISSILE SYSTEM

Charles R. Dietz, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 6, 1977, Ser. No. 804,036
Int. Cl.[2] F42B *15/10*
U.S. Cl. 102—49.4 **2 Claims**



1. An improved missile system of the type having a plurality of booster stages mounted in tandem and a payload stage with a plurality of separable payloads, said booster and payload stages being confined within a missile skin of a geometrically constrained configuration, wherein the improvement comprises:

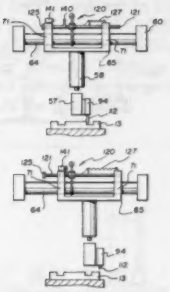
a booster rocket motor of near optimum length to diameter ratio axially mounted within said payload stage in tandem with said booster stages, said separable payloads being mounted on said payload stage in an annular area between said booster rocket motor and said missile skin, to provide greater range for said missile system within said geometrically constrained configuration.

4,131,066

REFERENCE MECHANISM FOR SPIKE DRIVER

Raymond R. Lund, West Columbia, S.C., assignor to Canron, Inc., New York, N.Y.

Filed Mar. 21, 1977, Ser. No. 779,635
Int. Cl.[2] E01B *29/2*
U.S. Cl. 104—17 R **9 Claims**



1. A machine for applying fastening members to rail tie plates to secure rails to ties, the machine comprising a frame, a sensor on said frame for sensing a fastening member location on the tie plate, and a drive head on said frame for applying a fastening member at the fastening member location, at least one guide rod on which the frame is mounted for movement parallel to the rails, means connected to said frame for moving the frame parallel to the rails in a direction in which the sensor leads the drive head, a reference mechanism on the frame and including clamping means connected to said sensor and operable on sensing by the sensor of the fastening member location to move from an unclamped condition to a clamped condition in which the reference mechanism is clamped to the guide rod, and switch means connected to said means for moving the frame and comprising a first component carried by the reference mechanism and a second interacting component carried by the frame, the switch means being operable on interaction of the first and second components to de-energize the means for moving the frame, the spacing between the first and second components in the unclamped condition of the reference mechanism being related to the spacing between the sensor and the drive head for causing the frame to continue its travel until the drive head is positioned above the fastening member location at which point the frame stops due to re-energization of the means for moving the frame.

4,131,067

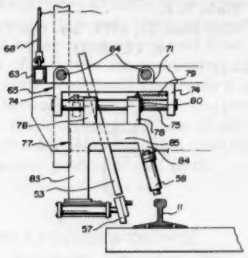
SPIKE DRIVER

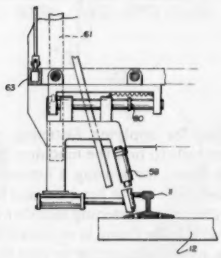
George R. Newman, Lexington, and Raymond R. Lund, West Columbia, both of S.C., assignors to Canron Railgroup, West Columbia, S.C.

Filed Mar. 21, 1977, Ser. No. 779,633
Int. Cl.[2] E01B *29/26*
U.S. Cl. 104—17 R **20 Claims**

1. A device for applying fastening members to rail tie plates to secure rails to ties, the device comprising a first mounting member carrying predetermined stroke means and driving means for driving a fastening member, fastening member holding means secured to the predetermined stroke means, said predetermined stroke means being operable for moving the holding means laterally towards a rail from a fully retracted position to a full stroke position, the lateral distance between the holding means in the retracted position and the driving head being equal to the stroke of the predetermined stroke

means, stop means rigidly connected with the holding means and engagable with the rail on operation of the predetermined stroke means to position the holding means a predetermined distance from the rail, a second mounting member fixed against movement laterally relative to the rail, the first mounting member being mounted on the second mounting member for movement laterally relative to the rail, and resilient means





interconnecting the first and second mounting members and biasing the first mounting member towards the rail to an inner biased position, whereby the mounting member moves laterally away from the rail to an outer position against the biasing action of the resilient means on engagement by the stop means with the rail to take up excess travel of the predetermined stroke means and position the driving head over the holding means.

4,131,068

CATCH ARRANGEMENT FOR TOWING CIRCULATING CONVEYOR WITH SIDE CIRCUIT

Erich Kuwertz, Trippstadt, Germany, assignor to psb-Pfalzstahlbau GmbH, Pirmasens, Germany

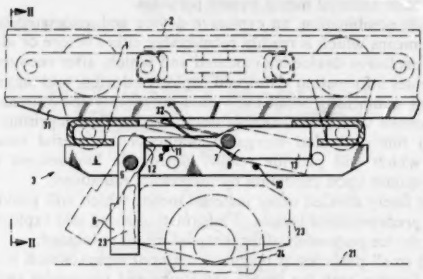
Filed May 9, 1977, Ser. No. 795,120

Claims priority, application Fed. Rep. of Germany, May 14, 1976, 2621411

Int. Cl.[2] B61J *3/04*

U.S. Cl. 104—172 S **2 Claims**

1. Catch mechanism for a tow conveyor of the type having a main track, a plurality of carriages for objects to be treated running on the main track, a tow chain and track for the same positioned above and paralleling said main track for moving carriers along said main track in the feed direction and switching means between the main track and the spur track to switch carriers from the main track to the spur track, a portion of said spur track close to said main track being downwardly inclined so that carriers started thereon continue to move along the spur track by gravity, and means to release carriers from the chain means in the area of a switch, the improved means to move a released carrier from the switching region of the main track comprising housing means connected to and suspended from the tow chain, said housing means comprising a first gudgeon in said housing extending transversely with respect to the feed direction in the rear of said housing with respect to the feed direction, a pivotable finger catch means mounted on said gudgeon so as to freely pivot thereabout and to normally extend vertically with its lower end in the path of a carrier, a second gudgeon mounted in the forward portion of said housing extending transversely with respect to the feed direction, double-arm lever means pivotally mounted on said second gudgeon, a first arm of said lever extending in the direction toward said finger catch means and the second arm thereof being weighted and extending in the direction away from said finger catch means whereby said first arm of said lever is



normally pivoted upwardly by the force of the second weighted lever arm, actuating means on said first arm of said lever, a contact means in the path of the chain guide means in the region of the switch to cooperate with said actuating means to push said first arm of the lever down to lock the finger of the catch means in its vertical locked position, said finger means in its vertical position cooperating with fixed means on the carrier to move the carrier out of the switching area a sufficient distance for the carrier to continue moving by gravity on said inclined portion of the spur track.

4,131,069

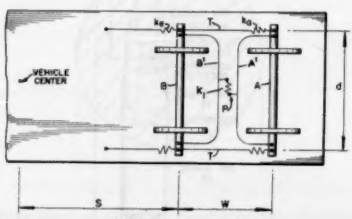
ARTICULATED RAILWAY CAR TRUCKS

Harold A. List, Bethlehem, Pa., assignor to Railway Engineering Associates, Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 438,334, Jan. 31, 1974, abandoned, which is a continuation-in-part of Ser. No. 222,999, Feb. 2, 1972, Pat. No. 3,789,770, which is a continuation of Ser. No. 882,359, Dec. 15, 1969, abandoned, which is a continuation of Ser. No. 680,257, Nov. 2, 1967, abandoned. This application Aug. 28, 1975, Ser. No. 608,596

Int. Cl.[2] B61F *3/08, 5/14, 5/24, 5/52*

U.S. Cl. 105—168 **22 Claims**



1. A vehicle running-gear comprising:

at least two load-carrying axles, movable to different relative angularities in a horizontal plane, each of said axles having a pair of spaced-apart wheels mounted thereon and adapted to transmit weight from the axle to the running surface on which the wheels roll; a pair of frame structures, one for each of said two axles, each frame structure having means for mounting its associated axle, and having in relation to its associated axle a substantially fixed angularity in a horizontal plane, and each frame structure extending from its associated axle to a common region substantially midway between said two axles; means in

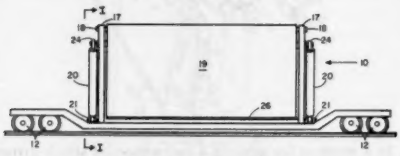
said region pivotally connecting one frame structure directly to the other thereof for transmitting steering forces between the axles, said means having predetermined stiffness against lateral motion in the direction of axle extension; framing including a pair of truck side frames each spanning a pair of adjacent axle ends and providing support thereof, said framing transmitting vehicle weight to the frame structures and thence to the axles independently of said means for pivotally connecting said frame structures; elastic means disposed to react between the ends of at least one axle and said side frames to provide restraint of the steering motions of the axles with respect to each other; and other elastic means for restraining motions of the axles with respect to the vehicle.

4,131,070

COKE QUENCHING CAR

Albert G. Jonnet, Oakdale, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jun. 30, 1977, Ser. No. 811,685
Int. Cl.[2] B60D *9/02*
U.S. Cl. 105—273 **6 Claims**



1. A coke quenching car comprising:
(a) a horizontal frame assembly of oblong shape;
(b) a plurality of wheels mounted to said frame and positioned to suspend said frame;
(c) a superstructure rigidly fixed to said frame;
(d) an oblong hopper, pivotally mounted to the upper extremity of said superstructure at pivot points adjacent to the top coke side corner of said hopper, the bottom of said hopper containing a port aperture extending the length of and approximately half of the width of said hopper;
(e) means to pivotally elevate said hopper about said pivot point;
(f) a gate pivotally mounted to the bottom of said hopper, positioned to cover said port aperture in said hopper at one end of the pivotation arc of said gate;
(g) a plurality of hydraulic gate cylinders, the base of each being pivotally mounted to an end edge of said gate, positioned to allow said gate to pivot away from said hopper, thus uncovering said port aperture; and
(h) a plurality of rods, one each of which is extensibly mounted within each said gate cylinder so as to extend and retract within said gate cylinder in the conventional manner, the exposed end of each being pivotally mounted to one end of said hopper at a point whereon extension of said rod from said gate cylinder produces a pivotation of said gate away from said bottom of said hopper.

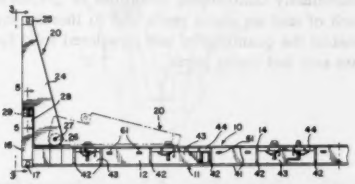
4,131,071

CARGO TRANSPORTATION DEVICE

John J. Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.

Continuation of Ser. No. 590,902, Jun. 27, 1975, abandoned.
This application Dec. 27, 1976, Ser. No. 756,023
Int. Cl.[2] B65D *19/12*
U.S. Cl. 108—53.1 **3 Claims**

1. A generally rectangular stackable cargo transportation device having a frame and a cargo platform thereupon,
upright support members at longitudinally opposite ends of the platform and extending thereabove,
an end bulkhead movable between a vertical raised position and a generally horizontal position associated and cooperative with each end support member to form a vertically extending cargo retaining end wall in the raised position and being stowable in the horizontal position,
each of said bulkheads including a transverse end wall portion and transversely spaced vertical posts having portions in alignment therewith and other portions widthwise of the end wall extending inwardly therefrom,
each of said other portions comprising a post having generally triangular vertical side plates and said plates having horizontal lower edge portions opposing the platform and being recessed and having portions above the recessed area in the plane of the end wall adapted to overlie and longitudinally abut the associated upright support member when the bulkhead is moved to the raised position to arrest outward rotation of the bulkhead therebeyond,
hinge means spaced longitudinally inward from each upright support member pivotally coupling the posts associated therewith at said plates to the cargo platform immediately above the top of the platform,



releasable interengaging latch means on said posts and the upper ends of the upright support members spaced above said platform and positioned in alignment with the related end wall and operative to directly oppose loads upon said end walls,
said latch means including a vertical recess in its associated upright support member,
a first transverse bore extending through said support member communicating with the recess,
slide bolt means movable in said first bore through the recess,
a keeper lug on each post receivable in the associated recess to assure vertical alignment of the bulkhead above the respective upright support and to arrest relative lateral movement therebetween, and
said lug including a second transverse bore registering with said first bore and releasably engagable by said slide bolt means in locking relation.

4,131,072

APPARATUS FOR INDIVIDUAL CONTROLLED DISTRIBUTION OF POWDERED SOLID FUEL TO PLURAL BURNING UNITS

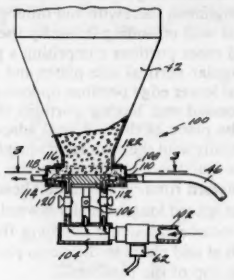
Hans Lingl, Jr., and Don E. Denison, both of Paris, Tenn., assignors to Lingl Corporation, Paris, Tenn.

Filed May 26, 1977, Ser. No. 800,855
Int. Cl.[2] F23K *3/02*
U.S. Cl. 110—106 **16 Claims**

7. Apparatus for individually and independently controlling distribution of powdered solid fuel to each of a plurality of individual burners, said apparatus comprising:
distributor means having a plurality of fuel outlet ports spaced apart therewithin, each of said fuel outlet ports being adapted for connection with a respectively corresponding one of said burners;
said distributor means also having a plurality of air outlet ports disposed within said apparatus, each of said air outlet ports being aligned with and spaced from a respectively corresponding one of said fuel outlet ports;
fuel supply means including stop plate means disposed in association with said fuel outlet ports and with said air outlet ports for feeding said powdered solid fuel onto said

stop plate means from which it simultaneously gravity feeds into the spaces between said outlet ports; and

individually controlled air supply lines connected to supply



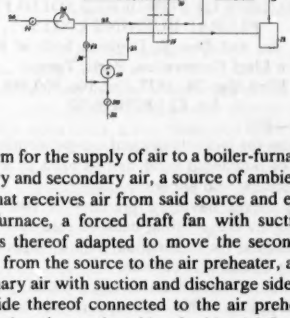
individually controllable quantities of pressurized air to each of said air outlet ports and to thereby individually control the quantities of said powdered solid fuel passing into said fuel outlet ports.

4,131,073

BOILER FAN ARRANGEMENT

Samuel S. Blackburn, Jr., Avon, and George P. Hammer, Simsbury, both of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Oct. 31, 1977, Ser. No. 847,338
Int. Cl.[2] F23L *15/00*; F23K *1/04*
U.S. Cl. 110—106 **5 Claims**



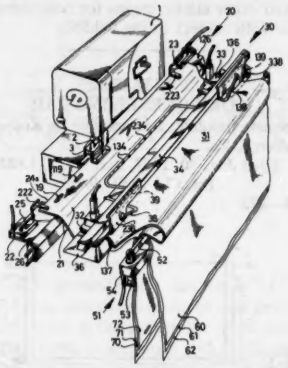
1. A system for the supply of air to a boiler-furnace requiring both primary and secondary air, a source of ambient air, an air preheater that receives air from said source and exhausts it to the boiler-furnace, a forced draft fan with suction and discharge sides thereof adapted to move the secondary air for combustion from the source to the air preheater, an axial flow fan for primary air with suction and discharge sides having the discharge side thereof connected to the air preheater, a first duct connecting the suction side of said axial flow fan to the discharge side of the forced draft fan, a second duct connecting the suction side of the axial flow fan to the source of air, and valve means controlling air flow through each of said duct means.

4,131,074

METHOD OF AND APPARATUS FOR THE SEWING OF A MULTIPLICITY OF STITCH GROUPS IN A WORKPIECE

Gerhard Riss, Bielefeld, Germany, assignor to Dürkoppwerke GmbH, Bielefeld, Germany

Filed Oct. 31, 1977, Ser. No. 847,050
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1976, 2650334
Int. Cl.[2] D05B *3/00, 33/00, 81/00*
U.S. Cl. 112—121.14 **13 Claims**



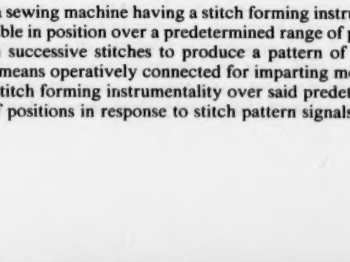
1. In a method for sewing a succession of stitch-groups in a workpiece in which a fabric workpiece is clamped and a relative displacement of a stitch-group sewing machine and a workpiece is carried out in a stepwise manner to form the successive stitch-groups in spaced-apart relationship in said workpiece the improvement wherein the workpieces held in the clamp are replaced successively and after the formation of a succession of stitch-groups in one workpiece by relative displacement in one direction, stitch-groups are formed in the successive workpiece by relative displacement in the opposite direction.

4,131,075

SPEED LIMITER FOR PATTERN STITCH SEWING MACHINE

John W. Wurst, Dover, N.J., assignor to The Singer Company, New York, N.Y.

Filed Oct. 31, 1977, Ser. No. 846,969
Int. Cl.[2] D05B *3/02, 69/36*
U.S. Cl. 112—158 E **6 Claims**



1. In a sewing machine having a stitch forming instrumentality variable in position over a predetermined range of positions between successive stitches to produce a pattern of stitches, driving means operatively connected for imparting movement to said stitch forming instrumentality over said predetermined range of positions in response to stitch pattern signals applied

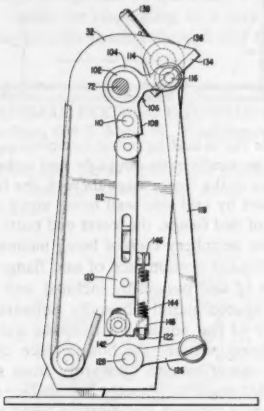
thereto, a drive motor coupled to move said stitch forming instrumentality so as to form stitches, means for supplying power to said drive motor, and means for interrupting the supply of power to said drive motor during operation of said driving means.

4,131,076

SEWING MACHINE WORK FEEDING MECHANISM

Ralph E. Johnson, Convent Station, N.J., assignor to The Singer Company, New York, N.Y.

Filed Nov. 14, 1977, Ser. No. 851,073
Int. Cl.[2] D05B *15/02*
U.S. Cl. 112—210 **4 Claims**



1. In cyclically operated work feed controlling mechanism for a sewing machine the combination comprising a feed dog shiftable through slots in a throat plate on said sewing machine, feed advancing mechanism for imparting alternate work feed and return strokes to said feed dog, feed lifting mechanism for imparting relative vertical movement to said feed dog and said throat plate to expose said feed dog above said throat plate during the feed strokes thereof, a stitch length regulator for selecting stitch length by selectively setting the magnitude of feed stroke imparted to said feed dog by said feed advancing mechanism, and mechanism operatively interconnecting the stitch length regulator, feed advancing mechanism and feed lifting mechanism for altering the timing of the operation of both the feed advancing mechanism and feed lifting mechanism when the stitch regulator is moved to change stitch length whereby the feed dog is caused to project above the throat plate substantially throughout the length of feeding strokes regardless of selected stitch length.

4,131,077

METHOD OF ATTACHING A SLIDE FASTENER TO AN ARTICLE

Ronald J. Boser, Huntington Station, N.Y., assignor to B & W Manufacturing Co., Inc., New York, N.Y.

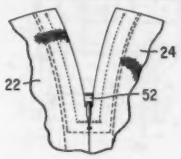
Continuation of Ser. No. 392,404, Aug. 28, 1973, abandoned, which is a division of Ser. No. 222,863, Feb. 2, 1972, Pat. No. 3,777,314. This application Jan. 27, 1975, Ser. No. 544,522
Int. Cl.[2] D05B *3/12*
U.S. Cl. 112—265 **3 Claims**

1. A method of installing a continuous slide fastener chain to a garment, the slide fastener chain having a leading end, and a trailing portion extending from the leading end, the slide fastener chain being of the type including first and second elongated tapes; the garment having a border, a seam termination point and opposed sides including the seam termination point, the opposed sides defining an opening extending from the seam termination point to the border of the garment, first and second sets of interengaged coupling elements attached to the first and second tapes, said slide fastener chain throughout its length being without a slider connected to the first and second sets of coupling elements, said method comprising the steps of

placing the garment in superposition with the leading end of the continuous slide fastener chain such that the opening of the garment is longitudinally aligned over the interengaged coupling elements at the leading end of the slide fastener chain;

sewing first and second parallel spaced lines of stitches to the first and second tapes at the leading end of the slide fastener chain and to the opposite sides of the garment thereby initially attaching the superposed garment to the leading end of the slide fastener chain, the first and second lines of stitches extending in a direction from adjacent the border to adjacent the seam termination point;

transversely cutting the first and second sewn tapes from the



first and second tapes of the trailing portion of the slide fastener chain at a point longitudinally spaced from the opening and disposed adjacent the sewn termination point;

continuing the sewing of the first line of stitches in another direction from the first line of stitches to the second line of stitches and transversely of the first and second tapes across the first and second sets of coupling elements; the continuing of the sewing of the first line of stitches forming a third line of stitches to further attach the first and second tapes of the leading end of the slide fastener chain to opposite sides of the garment, reinforcing the seam termination point and forming a bottom stop for the leading end of the slide fastener chain; and

securing a slider to the interengaged coupling elements at the leading end of the slide fastener chain attached to the opposite sides of the garment.

4,131,078

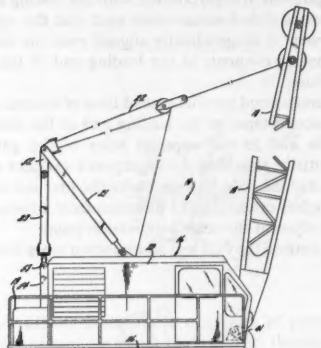
COLLAPSIBLE CRANE BACKHITCH AND OVERLOAD SIGNAL SYSTEM

James G. Morrow, Sr., Manitowoc, Wis., assignor to The Manitowoc Company, Inc., Manitowoc, Wis.

Filed Apr. 29, 1977, Ser. No. 792,100
Int. Cl.[2] G08B *07/04*
U.S. Cl. 116—4 **8 Claims**

1. An energy absorbing backhitch for a lift crane having a load handling boom supported by rigging connected to the backhitch mounted adjacent the rear end of the crane comprising, in combination, means including a lift pin for connecting said backhitch to said crane and means including an air source for detecting deflection of said lift pin when said crane is loaded, said detecting means including an air valve connected to said source and said lift pin including a flapper arm for throttling said valve upon deflection of said lift pin, said backhitch including upper and lower connecting sections one of which carries a pair of squeeze rollers, and a hollow deformable element having a flattened end projecting between said

rollers and connected to said other section, said hollow element being permanently collapsed and flattened between said



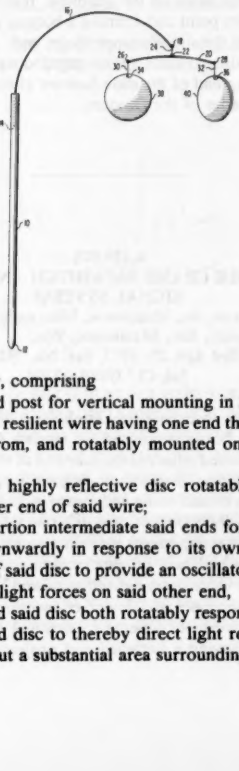
rollers when a predetermined tension load is applied to said backhitch tending to pull said upper and lower sections apart.

4,131,079

WIND ROTATED REFLECTIVE SCARECROW

John F. Rousseau, Jr., 34 Fernway Rd., and Charles E. Babin, 120 Jerusalem Rd., both of Cohasset, Mass. 02025

Filed Oct. 5, 1977, Ser. No. 839,751
Int. Cl.[2] G09F *11/02*
U.S. Cl. 116—22 A **10 Claims**



1. A scarecrow, comprising

A. an elongated post for vertical mounting in a field;

B. an elongated resilient wire having one end thereof extending axially from, and rotatably mounted on, one end of said post;

C. at least one highly reflective disc rotatably suspended from the other end of said wire;

D. the wire portion intermediate said ends forming an arc opening downwardly in response to its own weight and the weight of said disc to provide an oscillatory motion in response to slight forces on said other end,

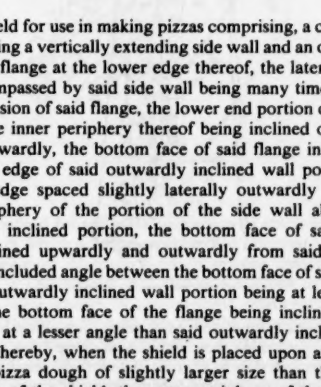
E. said wire and said disc both rotatably responsive to wind forces on said disc to thereby direct light reflected from said disc about a substantial area surrounding said post.

4,131,080

UTENSIL FOR MAKING PIZZAS

Leroy A. Hughes, 1018 Green Hills Dr., Ann Arbor, Mich. 48105

Filed Jul. 7, 1977, Ser. No. 813,515
Int. Cl.[2] B05C *19/00, 21/00*
U.S. Cl. 118—13 **7 Claims**



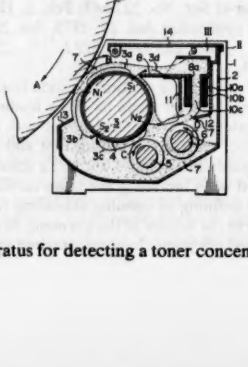
1. A shield for use in making pizzas comprising, a cylindrical shield having a vertically extending side wall and an outwardly extending flange at the lower edge thereof, the lateral dimension encompassed by said side wall being many times the lateral dimension of said flange, the lower end portion of the side wall at the inner periphery thereof being inclined outwardly and downwardly, the bottom face of said flange intersecting the lower edge of said outwardly inclined wall portion in a rounded edge spaced slightly laterally outwardly from the inner periphery of the portion of the side wall above said outwardly inclined portion, the bottom face of said flange being inclined upwardly and outwardly from said rounded edge, the included angle between the bottom face of said flange and said outwardly inclined wall portion being at least about 70° and the bottom face of the flange being inclined to the horizontal at a lesser angle than said outwardly inclined wall portion, whereby, when the shield is placed upon a flattened blank of pizza dough of slightly larger size than the lateral dimensions of the shield, the outer periphery of the flange is spaced above the dough and enables portions of the dough extending outwardly beyond the outer periphery of the flange to be tucked thereunder to conform the pizza dough blank to the lateral dimensions of the shield and the outwardly inclined portion of the side wall cooperates with said rounded edge and said upwardly inclined flange to form in the pizza dough a V-shaped groove having a rounded bottom which is spaced uniformly slightly inwardly from the outer periphery of the dough blank.

4,131,081

TONER CONCENTRATION DETECTING APPARATUS

Isamu Terashima, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 1, 1977, Ser. No. 783,554
Claims priority, application Japan, Apr. 14, 1976, 51-41352
Int. Cl.[2] G03G *15/09*
U.S. Cl. 118—646 **13 Claims**



1. An apparatus for detecting a toner concentration of devel-

oping powder comprising a mixture of magnetic carrier and toner comprising:

a transport means for transporting the developing powder stored in a chamber while magnetically attracting the developing powder;

a hollow body;

a guide means for diverting a portion of said developing powder from said transport means and directing the diverted developing powder to said hollow body;

means for producing a magnetic path sufficiently closely positioned to the downstream side of said hollow body for magnetizing the developing powder downstream of said hollow body to stabilize the flow of the developing powder passing through said hollow body; and

a response means for responding to a permeability of the developing powder passing through said hollow body.

4,131,082

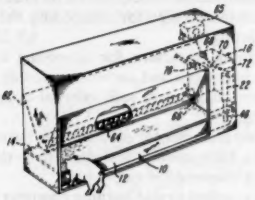
ANIMAL FEEDING EQUIPMENT

Herbert M. Sollars, 609 S. Main St., Washington Court House, Ohio 43160

Filed Jan. 31, 1977, Ser. No. 763,860

Int. Cl.[2] A01K *05/00, 05/02*

U.S. Cl. 119—51.5 **12 Claims**



10. Feed apparatus particularly suited for animal usage, comprising a tank supported in spaced elevated relation to a tray-like receptacle, the tank serving for storage of liquid and having an opening for discharge of its contents to the underlying receptacle, a hollow body disposed within the tank for movement to and from a closing relation to its discharge opening, said body having means defining an opening therefrom which in the function thereof aligns with said tank discharge opening, the entrance of liquid to said body by way of the opening therein causing the movement of said body to a closing relation to said tank discharge opening to prevent the dischrage of liquid from said tank, a discharge tube one end of which is fixed to rim said tank discharge opening to position the other end thereof in a spaced adjacent relation to the bottom of said receptacle, said other end of said discharge tube being positioned to be continuously immersed in liquid in said receptacle, and means in connection with said dischrge tube, the construction and arrangement of which provides for air to move upwardly of said discharge tube and into said body to induce a lifting thereof from a closing relation to said tank discharge opening when the liquid in said receptacle drops to a predetermined level above the lowermost end of said discharge tube.

4,131,083

BIRD UNIT

John J. Sokol, and Florence L. Sokol, both of 15 Robin Hood Dr., DeLand, Fla. 32720

Filed Mar. 10, 1977, Ser. No. 776,379

Int. Cl.[2] A01K *39/04*

U.S. Cl. 119—51.5 **1 Claim**

1. A bird unit comprising:

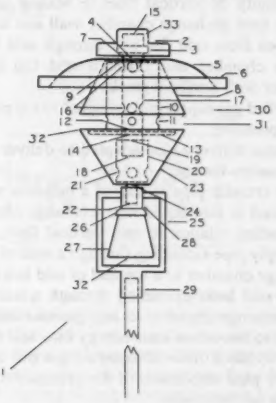
a. a dome having an upwardly projecting peripheral edge forming a channel reservoir to hold a supply of drinking water for birds,

b. a removable restraint funnel attachable beneath said dome and flaring outwardly and downwardly to restrict access to feed small birds,

c. a seed reservoir with dispensing openings and a hopper therebeneath, said reservoir being located within said dome and restraint funnel,

d. a fill tube having an open top which extends above said dome and access holes within said seed reservoir and terminating below said hopper in a reducing slip coupling,

e. a guide funnel flaring downwardly and inwardly and



attached at its bottom to said reducing slip coupling, said guide funnel having an open top with the top rim extending outwardly beyond the outer extent of the hopper to thereby direct waste seed downwardly and inwardly to said reducing slip coupling,

f. a catch jar removably attached to said reducing slip coupling,

g. an oblong square brace connected to a pole and suspending said catch jar therewithin, and

h. a removable cap supported on said fill tube.

4,131,084

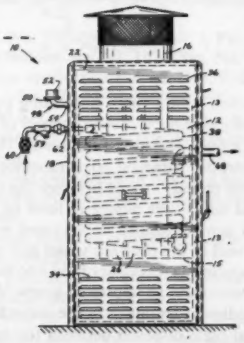
UPRIGHT DIRECT FIRED WATER BATH PROPANE VAPORIZER

Robert C. Hanson, Excelsior, and Leon C. Hanson, Bloomington, both of Minn., assignors to Energy Systems, Incorporated, Eden Prairie, Minn.

Filed Apr. 7, 1977, Ser. No. 785,409

Int. Cl.[2] F22B *1/02;* **F22D** *5/08, 5/26*

U.S. Cl. 122—33 **10 Claims**



1. Vaporizer apparatus for converting liquefied gas into vapor phase, said apparatus including:

A. a fire box;

B. a liquid heat exchange chamber vertically above the fire box, said liquid heat exchange chamber including:
(1) a main substantially vertically shell wall,
(2) a bottom wall,
(3) a top wall, and
(4) means to introduce a liquid heat exchange medium into said chamber;
C. a stack extending upwardly from said liquid heat exchange chamber;
D. a plurality of vertical flues in sealing relation to said bottom heat exchange chamber wall and to said top wall and open from said fire box through said liquid heat exchange chamber and through said top heat exchange chamber wall into said stack;
E. a liquefied gas supply pipe adapted to supply liquefied gas under pressure;
F. a gaseous delivery pipe adapted to deliver vaporized gas to a location for use;
G. a heat transfer pipe including a helically wound portion positioned in said liquid heat exchange chamber to lie in surrounding relation to said vertical flues, said liquefied gas supply pipe extending through a wall of the liquid heat exchange chamber to a top end of said helix and a bottom end of said helix extending through a wall of the liquid heat exchange chamber to said gaseous delivery pipe;
H. means to introduce heat energy into said fire box; and
I. means to block flow of liquefied gas out of said gaseous delivery pipe responsive to the presence of liquid in said gaseous delivery pipe.

4,131,085

VAPOR GENERATING UNIT BLOWDOWN ARRANGEMENT

Bertrand N. McDonald, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed May 4, 1977, Ser. No. 793,682
Int. Cl.[2] F22B *37/54*
U.S. Cl. 122—382 **4 Claims**

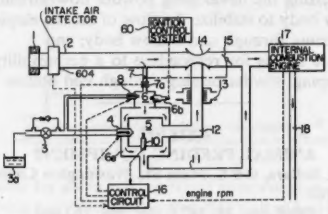
1. In combination with a vapor generating unit of the type having a vertically elongated pressure vessel of circular cross section housing a fluid heated U-tube bundle that has hot leg and cold leg portions attached to a tubesheet, a generally cylindrical shroud radially spaced between the pressure vessel vertical wall and the U-tube bundle to form an interior vapor chamber and an annular shaped downcomer bounded by the shroud and the wall of the pressure vessel and means for radially passing a vaporizable secondary fluid into the vapor chamber from the downcomer, an improved means of de-entraining and removing sediment entrained in the secondary fluid comprising a vertical plate disposed between the hot leg and the cold leg, means for proportionately regulating secondary fluid flow into the hot and cold legs and blowdown means in the vapor chamber communicating with the exterior of the pressure vessel.

4,131,086

FUEL REFORMING APPARATUS FOR USE WITH INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jul. 17, 1975, Ser. No. 596,743
Claims priority, application Japan, Jul. 20, 1974, 49-83693; Jul. 22, 1974, 49-84345; Dec. 26, 1974, 50-2053
Int. Cl.[2] F02B *43/08;* F02M *31/04*
U.S. Cl. 123—3 **8 Claims**



1. In an internal combustion engine including an engine combustion chamber, an intake pipe for supplying at least air to said engine combustion chamber, and a throttle valve pivotally disposed in said intake pipe for controlling the amount of air passing therethrough,
a fuel reforming apparatus for supplying a reformed gas including hydrogen and carbon monoxide to said engine combustion chamber of said internal combustion engine comprising:
(i) a burning chamber for substantially burning a charge of air and a hydrocarbon fuel therein, to thereby produce heat and combustion gas;
(ii) means coupled to said burning chamber for charging in said burning chamber said charge of air and a fuel and controlling the amount of said charge of air and a fuel in response to the amount of air passing through said intake pipe;
(iii) a catalytic reactor having therein a catalyst for reforming hydrocarbon fuel into a reformed gas including hydrogen and carbon monoxide, said catalytic reactor being communicated with said burning chamber so that said combustion gas from said burning chamber is introduced into said catalytic reactor;
(iv) means for supplying at least a hydrocarbon fuel to said catalytic reactor to reform said hydrocarbon fuel into the reformed gas with the aid of said heat, combustion gas and catalyst, through an endothermic reaction in said catalytic reactor; and
(v) means communicating said catalytic reactor with said engine combustion chamber of said internal combustion engine for introducing said reformed gas thereto.

4,131,087

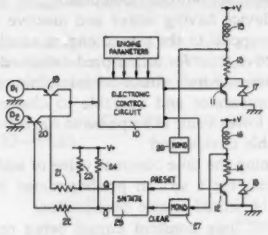
FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Malcolm Williams, Solihull, England, assignor to The Lucas Electrical Company Limited, Birmingham, England

Filed Nov. 10, 1975, Ser. No. 630,703
Claims priority, application United Kingdom, Nov. 22, 1974, 50805/74
Int. Cl.[2] F02M *51/00*
U.S. Cl. 123—32 EA **6 Claims**

1. In an internal combustion engine having split air intake and exhaust systems, a fuel injection system therefor comprising at least two electrically operated injectors associated with the intake systems respectively, a control unit for alternately operating the injectors, said control unit including means for producing electrical output pulses of length dependent on an engine parameter, a pair of transducers for measuring said parameter, said transducers being associated with the two

intake systems respectively, and a time sharing multiplex circuit arrangement connecting said transducers to the control



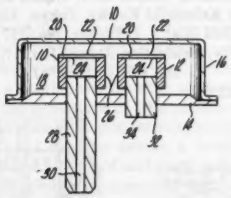
unit and operating in synchronism with the operation of the injectors so that the electrical outputs of the transducers are applied alternately to the control means.

4,131,088

MULTIPLE FUNCTION PRESSURE SENSOR

Junuthula N. Reddy, Troy, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 8, 1976, Ser. No. 739,400
Int. Cl.[2] F02B *3/00*; G01L *9/04*
U.S. Cl. 123—32 EJ **7 Claims**



1. In combination with an electronic fuel control system for an internal combustion engine having an air intake manifold, wherein said electronic fuel control system requires a first input signals indicative of the absolute value of the air pressure in the engine's air intake manifold, a second input signal indicative of the absolute value of the atmospheric pressure, and a third input signal indicative of the difference between the pressure in the engine's intake manifold and atmospheric pressure, a multi-function pressure sensor comprising

first pressure sensor generating a first pressure signal, said first pressure sensor including a first pressure sensitive member and means for applying a first pressure to one side of said first pressure sensitive member;

second pressure sensor generating a second pressure signal, said second pressure means including a second pressure sensitive member and means for applying a second pressure to one side of said second pressure sensitive member;

a housing having an internal chamber, said housing supporting said first and second sensor means having the opposite sides of said first and second pressure sensitive members exposed to said internal chamber, said internal chamber communicating a third pressure to the opposite sides of said first and second pressure sensitive members; and

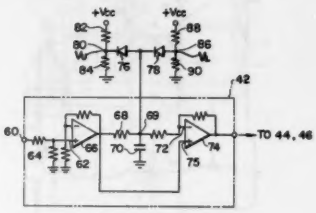
circuit means combining the signal generated by said first pressure sensor with the signal generated by said second pressure sensor for generating a signal which is a function of said first and said second pressure signals, said circuit means outputting a signal indicative of the absolute pressure in the engine's air intake manifold, a signal indicative of atmospheric pressure and a signal indicative of the pressure difference between atmospheric pressure and the pressure in the engine's air intake manifold.

4,131,089

ELECTRONIC CLOSED LOOP AIR-FUEL RATIO CONTROL SYSTEM

Takeshi Fujishiro, Yokohama; Shigeo Aono, Seki; Akio Hosaka, Yokohama; Masaharu Asano, Yokosuka; Nobuzi Manaka, Yokosuka, and Mituhiko Ezoe, Yokosuka, all of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Feb. 9, 1977, Ser. No. 767,134
Claims priority, application Japan, Feb. 9, 1976, 51-12242
Int. Cl.[2] F02B *3/08*; F02M *7/12*; F01N *3/08*
U.S. Cl. 123—32 EE **9 Claims**



1. A closed loop mixture control system for an internal combustion engine including means for supplying air and fuel thereto in a variable ratio and an exhaust composition sensor for generating a first signal representative of the concentration of an exhaust composition of the emissions from said engine, said first signal varying within a range between high and low voltage levels depending upon whether the sensed concentration is above or below a predetermined value, comprising:

mean-value detecting means for generating a second signal representative of a mean voltage value of said first signal so that said second signal varies within a range narrower than the range of said high and low voltage levels so long as said first signal is continuously varying;

differential amplifier means for generating a third signal representative of the difference in magnitude between said first signal and said second signal to represent the deviation of the air-fuel ratio of the emissions from a desired air-fuel ratio for adjusting said air-fuel suppying means with the represented deviation; and

limiting means for limiting the magnitude of said second signal at one of upper and lower predetermined threshold levels.

4,131,090

TWO-STROKE, MULTICYLINDER, SPARK IGNITION, PUMPLESS INJECTION INTERNAL COMBUSTION ENGINE

Stanislaw Jarnuszkiewicz, 29/8 Swierczewskiego Str., Krakow, Poland

Division of Ser. No. 521,896, Nov. 7, 1974, Pat. No. 4,020,801.
This application Jun. 21, 1976, Ser. No. 698,781
Claims priority, application Poland, Nov. 9, 1973, 166446
Int. Cl.[2] F02B *13/10, 19/00*
U.S. Cl. 123—32 SP **4 Claims**

1. A two stroke pumpless fuel injection internal combustion engine comprising:

a first and second cylinder each having a piston therein and each defining a working space in which said pistons move up and down,

a precombustion chamber connected to the working space of said first cylinder,

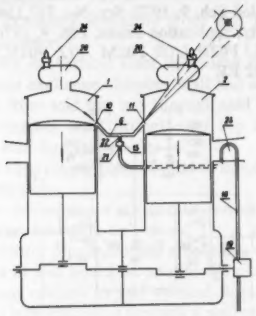
a connecting duct connecting the respective working space of said first and second cylinders,

an injection port in said first cylinder at one end of said connecting duct and an ejection port in said second cylinder at the other end of said connecting duct,

said connecting duct being positioned in such a way that its axis of symmetry is directed towards said precombustion chamber,

a spark plug whose sparking end is in said precombustion chamber and is within the area defined by the injection stream of the fuel being directed into said precombustion chamber, and

fuel supply means for supplying fuel to said connecting duct inbetween said injection and ejection ports,



said fuel supply means comprising a valveless metering chamber with a capacity greater than the maximum charge of fuel needed for one working cycle, said metering chamber being connected to said connecting duct and to a fuel feeding duct for preventing uncontrolled receiving of fuel from the fuel feeding duct.

4,131,091

VARIABLE GAIN CLOSED-LOOP CONTROL APPARATUS FOR INTERNAL COMBUSTION ENGINES

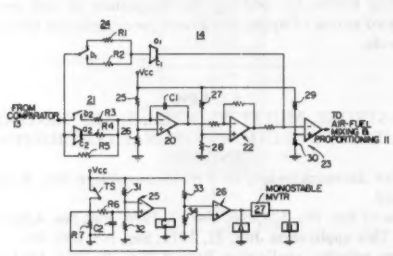
Masaharu Asano, and Nobuzi Manaka, both of Yokosuka, Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Oct. 22, 1976, Ser. No. 734,752

Claims priority, application Japan, Oct. 27, 1975, 50/128348; Dec. 25, 1975, 50/154100

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EH **13 Claims**



1. A mixture control apparatus for an internal combustion engine having means for sensing an exhaust composition of the emissions from the engine, air-fuel mixing and proportioning device for said engine, and a comparator for generating an output when the sensed composition reaches a predetermined value, the apparatus comprising:

means for sensing acceleration and deceleration of the engine; and

an intergral controller operable to provide integration of the output from the comparator at a higher rate of integration for a first predetermined time period after the sensing of the engine acceleration than during the time prior to the sensing of the engine acceleration and at a lower rate of integration for a second predetermined time period after the sensing of the engine deceleration than during the time prior to the sensing of the engine deceleration, the output from the integral controller being applied to the air-fuel mixing and proportioning device; and

wherein said integral controller comprises:

a monostable device having active and inactive states and operable to respond to the sensed engine acceleration to assume its active state for a first predetermined interval;

a variable RC time constant circuit for integrating the output from said comparator and operable to change its time constant to a lower value in response to the active state of said monostable device; and

means for retaining the time constant value of said RC time constant circuit for a second predetermined interval in response to the sensed engine deceleration;

said variable RC time constant circuit being operable to change its time constant to a higher value in response to the elapse of said second predetermined interval.

4,131,092

FLAME GUIDE CHANNEL FOR INTERNAL COMBUSTION ENGINE

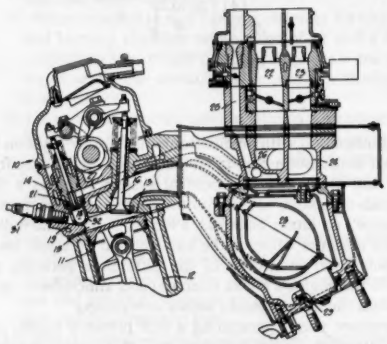
Yasuhito Sato, Kamifukuoka; Minoru Tanaka, Choufu, and Akihisa Nakamura, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1977, Ser. No. 757,688

Claims priority, application Japan, Jan. 17, 1976, 51-3773

Int. Cl.[2] F02F *1/42*

U.S. Cl. 123—32 ST **4 Claims**

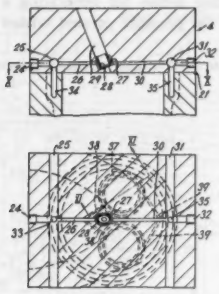


1. In an internal combustion piston engine, the combination of: a wall in the underside of a stationary head of the engine cooperating with a movable piston to form a main combustion chamber, means forming an auxiliary combustion chamber at one side of said main combustion chamber, a torch passage connecting said chambers, an intake valve and an exhaust valve opening into said main ocmbustion chamber and positioned remotely and substantially equidistantly from said torch passage, a flame guide channel formed in the walls in the underside of the head laterally diverging from said torch passage toward said valves, the depth of the flame guide channel decreasing as its width increases, means for supplying a lean mixture to the main combustion chamber through said intake valve, means including an auxiliary intake valve for supplying a rich mixture to said auxiliary chamber, means for igniting a mixture in said auxiliary chamber to cause a flame to project through said torch passage and through said flame guide channel across said main combustion chamber, said flame guide channel promoting a flame spread across the top of the main combustion chamber.

4,131,093
INTERNAL COMBUSTION ENGINES

Wilfred P. Mansfield, Chandlers Ford, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 478,885, Jun. 12, 1974, abandoned.
This application Nov. 17, 1975, Ser. No. 632,662
Claims priority, application United Kingdom, Jun. 21, 1973, 29500/73
Int. Cl.[2] F01P *1/06, 9/04*
U.S. Cl. 123—41.85 **5 Claims**



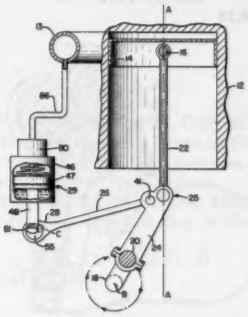
1. An internal combustion engine comprising:
a cylinder block,
a plurality of cylinders disposed within said block, each including a cylinder head member and having parts liable in use to overheat, namely means for injecting fuel, a valve seat member, a valve guide member and a small section of the length of the cylinder wall adjacent the head member, less deep axially than the combustion zone;
said block and head member having a small bore annular duct formed about at least one of said parts and said block and head member having passages connecting said annular ducts in a path between a cooling fluid source and a cooling fluid outlet, said passages comprising only the minimum fluid passages necessary to conduct sufficient fluid directly to and from said annular ducts so as to cool said overheating parts, the remainder of said block and head member including no ducts exclusively for cooling creating substantial cooling effect and situated in use in the path of fluid flow between a source and an outlet for cooling fluid.

4,131,094
VARIABLE DISPLACEMENT INTERNAL COMBUSTION ENGINE HAVING AUTOMATIC PISTON STROKE CONTROL

George W. Crise, P.O. Drawer A, Danville, Ohio 43014

Filed Feb. 7, 1977, Ser. No. 766,207
Int. Cl.[2] F02B *75/04*
U.S. Cl. 123—48 B **2 Claims**

1. In an internal combustion engine which includes a combustion cylinder, fuel induction means for conducting fuel to said cylinder, a piston movable in opposite directions along the axis of said cylinder, and a crankshaft stationarily journalled for rotation about a single axis disposed in right angular relation to the axis of said cylinder; that improvement which comprises:
(a) an articulated connecting rod consisting of two hingedly connected, angularly related levers extending between and pivotally connected, respectively, with the piston and crankshaft of said engine;
(b) an elongated guide rod pivotally connected at one end thereof to the crankshaft-connected lever of said connecting rod adjacent the hinge connection between said levers and having an opposite end extending generally laterally outwardly from said levers; said guide rod being movable longitudinally to vary the stroke of the piston within the cylinder of said engine; said guide rod and said articulated connecting rod being arranged to rotate said crankshaft through an arc substantially greater than 180° upon a full stroke of said piston in one direction and through an arc substantially less than 180° upon a full stroke of said piston in the opposite direction; and

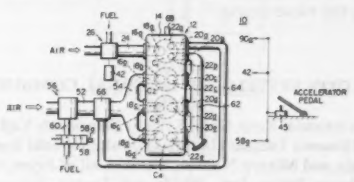


(c) control means connected with the opposite end of said guide rod and operable to move said guide rod longitudinally in response to variations of pressure within the fuel induction means of said engine.

4,131,095
INTERNAL COMBUSTION ENGINE OPERATED ON A REFORMED GAS

Keido Ouchi, Ayase, Japan, assignor to Nissan Motor Company, Ltd., Japan

Filed Mar. 17, 1977, Ser. No. 778,425
Claims priority, application Japan, Mar. 19, 1976, 51-30579
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—59 EC **10 Claims**



1. An internal combustion engine system having an engine proper forming therein at least first and second combustion chambers, and an exhaust manifold fluidly communicable with the second combustion chamber, said system comprising:
first intake means for feeding first and second combustion mediums into said first combustion chamber when first and second conditions of said engine take place, respectively;
second intake means for feeding a third combustion medium into said second combustion chamber when said second condition takes place;
reformed gas transmitting means for transmitting a product produced in said first combustion chamber into said second combustion chamber when said first condition takes place;
exhaust means for feeding a product produced in said first combustion chamber into said exhaust manifold when said second condition takes place; and
control means for causing said first and second conditions when lower and higher engine power outputs are required, respectively.

4,131,096

VALVE TIMING MECHANISMS

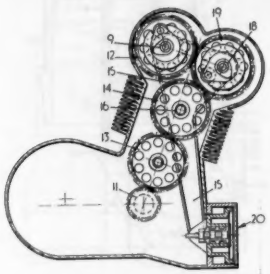
Stephen W. Mitchell, 93 Lowercroft Rd., Starling, Bury, Lancashire, England

Filed Mar. 21, 1977, Ser. No. 779,877

Claims priority, application United Kingdom, Apr. 2, 1976, 13370/76

Int. Cl.[2] F01L *1/34*

U.S. Cl. 123—90.15 **17 Claims**



2. An internal combustion engine comprising at least one cylinder, at least one inlet and at least one exhaust valve for the or each cylinder, camshafts, said camshafts having at least one cam element fixedly mounted thereon for opening the inlet and outlet valves of the or each cylinder, a crankshaft, and means for driving the camshafts from the crankshaft, the driving means comprising a movable member rotatable by the crankshaft and connected to at least one camshaft by an eccentric linkage, and the rotatable member being movable in translation relative to said at least one camshaft in dependence upon an operating condition of the engine, movement of the movable member causing the eccentric linkage to vary the angular position of the camshaft about its axis of rotation relative to the angular position of the crankshaft about its axis of rotation and also to vary the rate of angular movement of the camshaft relative to the angular velocity of the crankshaft, thereby varying the valve timing.

4,131,097

IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Daisaku Sawada; Kenji Goto; Takashi Shigemaut; Yuji Takeda, all of Susono; Tadashi Hattori, Okazaki; Hiroaki Yamaguchi, Nakata, and Minoru Nishida, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Jan. 27, 1977, Ser. No. 763,153

Claims priority, application Japan, Feb. 5, 1976, 51-11714; Jun. 11, 1976, 51-68945

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **6 Claims**

1. An ignition system for controlling the timing of ignition of an internal combustion engine comprising:

position detecting means for detecting a predetermined rotational angular position of said engine to produce an angular position signal;

pressure detecting means for detecting the pressure present within the cylinder of said engine to produce a pressure signal;

maximum pressure detecting means for detecting the maximum value of the pressure represented by said pressure signal;

reference pressure detecting means for detecting the reference value of the pressure represented by said pressure signal at a timing represented by said angular position signal;

discriminating means for discriminating means for discriminating whether the ratio of said maximum value relative to said reference value is larger than a predetermined value; and

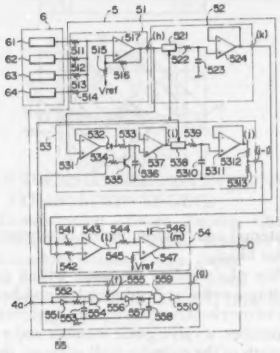
timing control means for controlling the timing of ignition in response to the discrimination result of said discriminating means.

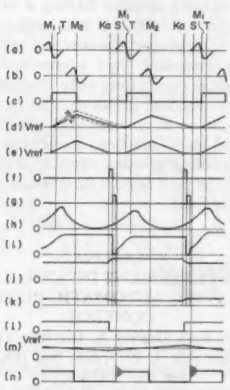
4. An ignition system for controlling the timing of ignition of an internal combustion engine having a cylinder, said ignition system comprising:

position detecting means for generating an angular position signal indicative of the rotational angular position of said engine;

pressure detecting means for generating a pressure signal indicative of the pressure present within the cylinder of said engine;

maximum pressure detecting means, responsive to said pressure signal, for generating a Pmax signal indicative of the maximum value of the pressure within the cylinder during a cycle of operation;





reference pressure detecting means, responsive to said angular position signal and said pressure signal, for generating a P1 reference signal indicative of the pressure within the cylinder with said engine in a predetermined reference angular position;

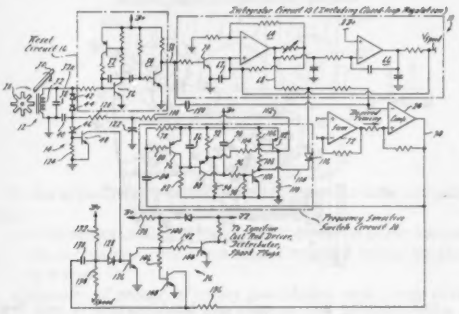
discriminating means, responsive to said Pmax signal and said P1 signal, for generating a control signal indicative of the ratio of said maximum value of pressure relative to said pressure with the engine in said reference angular position; and

timing control means for controlling the timing of ignition in said engine in response to said control signal discriminating means.

4,131,098
ENGINE TIMING CONTROL CIRCUIT HAVING A SINGLE PICK-UP FOR BOTH STARTING AND RUNNING

Earl E. Daniels, Taylor, and Frederick W. Crall, Farmington Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Dec. 20, 1976, Ser. No. 752,492
Int. Cl.[2] F02P 5/04
U.S. Cl. 123—117 R 23 Claims



1. In an internal combustion engine, an electronic engine timing control circuit comprising:

transducer means operatively coupled with the engine for producing pulses which exhibit a zero voltage crossing at predetermined engine crank angles;

an output circuit which is triggered to produce an engine control signal;

an integrator circuit providing an output signal;

reset circuit means coupling said transducer means and said integrator circuit for resetting the latter from said pulses;

means providing a desired timing signal derived from at least one parameter useful in determining the timing of said engine control signal;

comparator circuit means for comparing the integrator output signal with the desired timing signal and producing an output trigger signal when a predetermined relationship between the two is attained;

means coupling said comparator circuit means to said output circuit so that an output trigger signal from said comparator circuit means can cause said output circuit to be triggered;

a zero crossing detector coupling said transducer means and said output circuit so that zero crossing of said pulses can cause said output circuit to be triggered;

and means for selectively controlling triggering of said output circuit from said zero crossing detector and said comparator circuit means comprising frequency sensitive switch means for sensing the frequency of a signal representative of engine speed and providing one switch condition when the sensed engine speed is less than a given speed and another switch condition when the sensed engine speed exceeds said given speed, means coupling said frequency sensitive switch means and said zero crossing detector for causing zero crossings of said pulses to trigger said output circuit when said frequency sensitive switch means is in its one switch condition, means coupling said frequency sensitive switch means and said comparator circuit means for causing said comparator circuit means to trigger said output circuit when said frequency sensitive switch means is in its another switch condition;

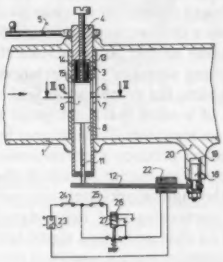
wherein said transducer means comprises an inductance coil; and

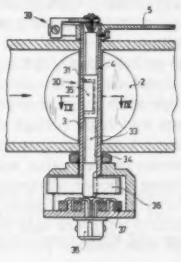
wherein said zero crossing detector comprises first and second diode means, said two diode means having a common junction, said first diode means being connected across said inductance coil, said second diode means including the base-emitter junction of a transistor, said transistor being switched from one conductivity condition to another conductivity condition by the zero crossing of said pulses when said frequency sensitive switch means is in its one switch condition.

4,131,099
IDLING AND WARM-UP FUEL CONTROL DEVICE

Wolf Wessel, Oberriexingen, and Hermann Grieshaber, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 4, 1976, Ser. No. 738,980
Claims priority, application Fed. Rep. of Germany, Jan. 24, 1976, 2602698
Int. Cl.[2] F02B 33/00
U.S. Cl. 123—119 F 9 Claims





1. A by-pass valve for controlling the mixture quantity delivered to a mixture compressing, externally ignited internal combustion engine during idle running and warm running of the engine, the engine having a suction tube connected thereto which defines a mixture quantity flow path, and a throttle valve mounted to the suction tube transversely of the mixture quantity flow path, the by-pass valve comprising:

a mounting shaft for the throttle valve, mounted to the suction tube for rotation relative to the suction tube, said mounting shaft having an aperture which extends transversely through the mounting shaft forming a part of the mixture quantity flow path, said aperture being located approximately at the medial region of the mounting shaft within the suction tube;

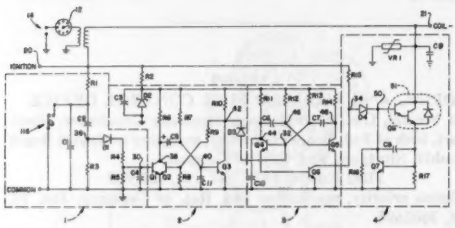
a movable valve component; and

control means connected to the movable valve component for arbitrarily controlling the movement of the movable valve component relative to the mounting shaft, to thereby arbitrarily vary the portion of the mounting shaft aperture forming part of the mixture quantity flow path.

4,131,100
MULTIPLE SPARK DISCHARGE CIRCUITRY

James W. Merrick, El Paso, Tex., assignor to Autotronic Controls, Corp., El Paso, Tex.

Filed Apr. 26, 1977, Ser. No. 791,098
Int. Cl.[2] F02P 1/00
U.S. Cl. 123—148 E 19 Claims



1. In an internal combustion engine having a source of DC current, a spark gap connected to ignite a combustible mixture contained within a combustion chamber thereof in timed relationship respective to the power stroke thereof, and means generating a timing signal in timed relationship to the power stroke of the piston, the combination with said internal combustion engine of a multi-spark discharge system comprising means forming an input signal conditioner by which the timing signal is treated to produce a corresponding input signal; a firing duration control circuit by which the duration of time within which the multi-spark discharge occurs is determined; circuit means connecting said input signal to said duration control circuit so that said input signal initiates operation of said duration control circuit; a repetition rate control for determining the number of sparks occurring with the time duration provided by said duration control circuit; a high voltage discharge circuit for providing a high tension discharge across said spark gap; circuit means connecting said duration control circuit to said repetition rate control and said repetition rate control to said high voltage discharge circuit, whereby said conditioned input signal causes the firing duration control circuit to initiate operation of said repetition rate control which in turn causes said high voltage discharge circuit to discharge across the spark gap in proper timed relation respective to the power stroke of the engine; said high voltage discharge circuit including a power darlington connected to be triggered by said repetition rate control, said rate control determining the number of times said power darlington is turned on during the time interval provided by said duration control.

4,131,101
ENCLOSURE SPANNING DRAIN FOR ENGINE VALLEY COVERS AND THE LIKE

Robert E. DeVinney, Lansing, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 2, 1977, Ser. No. 830,132
Int. Cl.[2] F02F 7/00
U.S. Cl. 123—195 C 5 Claims

1. The combination in a combustion engine of wall means defining a cavity for lubricated mechanism and adapted to contain a lubricant, said wall means having upwardly extending sides and an open top,

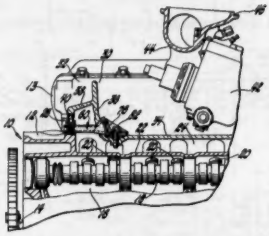
a cover member mounted on said wall means and closing said open top to retain fluids within the cavity and prevent dilution of the lubricant with foreign substances, said cover member having downwardly sloping wall portions defining an open valley extending within the upper part of said cavity,

and the improvement comprising:

a first drain opening through said cover member between said valley and lubricant cavity, said opening having an axis and forming an annular seat facing said valley,

a second drain opening through said wall means between said lubricant cavity and the exterior of said wall means, said second opening comprising a cylindrical bore having an axis aligned with said first opening but at an angle to said first axis,

a drain tube extending into and between said drain openings generally along the axis of said second opening, said drain tube including an annular sealing portion on its exterior which sealingly engages the cylindrical bore of said sec-



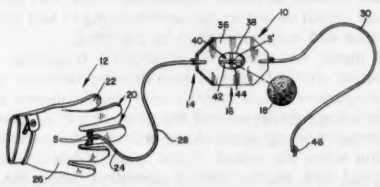
ond opening and an enlarged head portion in said first opening, said head portion being centered on an axis substantially coincident with the axis of said first opening and sealingly engaging said annular seat, said drain tube having an open passage therethrough connecting said cover valley with the exterior of said wall means to drain said valley, and

retaining means holding said drain tube in position such that the enlarged head and annular sealing portions, respectively prevent leakage of fluids into or out of said cavity through said first and second openings.

4,131,102
BALL THROWING SLING

John R. Polly, Jr., M.P.O. Box 5884, Oxnard, Calif. 93031

Filed Jul. 18, 1977, Ser. No. 816,679
Int. Cl.[2] A41B 3/00
U.S. Cl. 124—5 7 Claims



1. A sling, comprising, in combination:

(a) a glove;

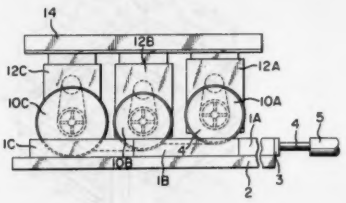
(b) a longitudinally extending, flexible element having a pair of longitudinally spaced ends, and being attached to the glove at one of the ends; and

(c) pocket means inserted into the flexible element intermediate the longitudinal extent thereof for receiving an object to be thrown, the glove including a hand portion and a finger portion, the flexible element having the one of the longitudinal ends affixed to the finger receiving portion of the glove.

4,131,103
APPARATUS FOR SAWING STONE

Hiroshi Ishizuka, 19-2 Ebara 6-Chome, Shinagawa-Ku, Tokyo, Japan

Filed Apr. 12, 1977, Ser. No. 786,842
Claims priority, application Japan, May 17, 1976, 51-56343
Int. Cl.[2] B28D 1/04
U.S. Cl. 125—13 R 3 Claims



1. An apparatus for sawing stone blocks into slabs comprising:

a work bed extending in longitudinal direction of the apparatus and carrying the stone blocks adjacent to one another in a row;

a plurality of groups of rotary saw blades, each group comprising a plurality of saw blades each arranged with a spacing therebetween which corresponds to a desired thickness of the slabs to be obtained, each group of rotary saw blades being mounted on a common shaft driven by an electric motor means;

said plurality of groups of rotary saw blades being disposed in series one behind another along the work bed and adjustably arranged relative to the work bed of the apparatus;

means for feeding the stone blocks on the work bed through the groups of said saw blades, the saw blades of each group being arranged in alignment but in a different position relative to the work bed so that the saw blades of every group have common cutting planes but stepwise increasing cutting depths from the first to last group of saw blades, the improvement comprising:

a stone block feeding means including a main and an auxiliary feeder;

said main feeder includes a hydraulic piston member to push the stone block on said work bed at the rear end thereof towards the first group of saw blades; and

said auxiliary feeder being cooperatively combined with said main feeder and having another hydraulic piston member with a grasper at one end;

whereby the stone blocks positioned in a row can be transferred as a whole along the cutting planes in such a way that the auxiliary feeder is actuated to graspingly transfer the stone blocks toward the first group of saw blades in lieu of said main feeder when the piston member for said main feeder is retracted for loading an additional supply of stone blocks on the work bed, until the leading end of the additional supply of stone blocks comes into contact with the trailing end of the preceding stone block by the action of the piston member for said main feeder.

4,131,104
LOG-BURNING STOVE

James R. Choate, Rochester, N.H., assignor to Hydraform Products Corp., Rochester, N.H.

Filed Apr. 21, 1977, Ser. No. 789,517
Int. Cl.[2] F24C 1/00
U.S. Cl. 126—60 13 Claims

1. A log-burning stove which comprises:

(a) a shell defining a combustion chamber for the combustion of logs;

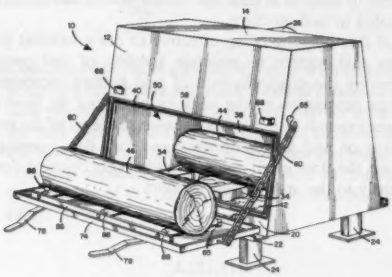
(b) a flue for the discharge of gaseous combustion products derived from the combustion of the logs;

(c) an entrance in one wall of the shell and into the combustion chamber for the introduction of logs into the combustion chamber;

(d) a door adapted to be placed in an open or a closed position, and which door, in the closed upright position, seals the entrance, and, in the open position, extends generally laterally outwardly adjacent to and from the lower bottom edge of the entrance;

(e) means to provide for the movement of the door between an open and a closed position; and

(f) movable means positioned on the internal surface of the door and disposed in the plane of the door, which means

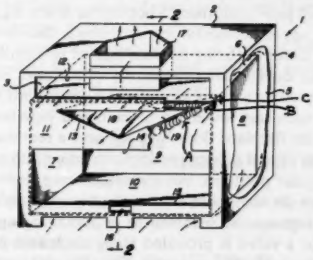


comprises a plurality of spaced-apart, freely rotatable rollers, each roller disposed for rotation on a fixed axis element, the ends of the axis element supported on the interior of the door, the rollers disposed on a plane generally parallel to the door and the axis elements of the rollers being generally perpendicular to the entrance when the door is in the open position, the means adapted when the door is in fully the open position to permit the movement of a log on the surface of such means generally parallel to the entrance to the stove and to a position adjacent to the stove entrance and to permit the log so positioned to be moved thereafter on the rollers in a different direction through the stove entrance and into the combustion chamber.

4,131,105
HEATING UNIT WITH VORTICAL AEROTHERMODYNAMIC FLOW CONTROL

Alexander J. Moncrieff-Yeates, 8924 Rhyme Court, Annandale, Va. 22003

Continuation-in-part of Ser. No. 570,798, Apr. 23, 1975, Pat. No. 4,056,091. This application Aug. 29, 1977, Ser. No. 828,930
Int. Cl.[2] F24B 7/00
U.S. Cl. 126—121 10 Claims



1. In a heating unit including a fire enclosure defined in part by a back wall, side walls, a top surface, and having at least one flue opening, and a front wall extending downwardly from a

juncture with a front portion of said top wall and including a fire enclosure access opening therein, the improvement wherein

A. said fire enclosure access opening is defined

a. at its upper extent by a first edge of said front wall disposed substantially below the enclosure top wall and

b. at its lower extent by a second edge of said front wall disposed substantially above the lower extreme of said fire enclosure at a position substantially at least as high as the level of support of fuel in said enclosure,

B. the area of said juncture of said top and front walls defining throughout the extent of said juncture a laterally extensive aerothermodynamic vorticity area open to the flame enclosure generally and wherein heated air is induced to whirl in at least one vortex pattern having an axis parallel to said juncture,

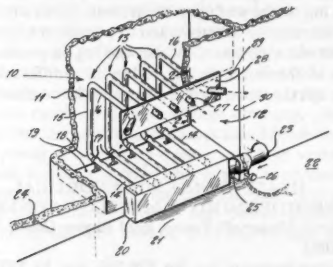
C. said flue opening being effective to draw exhaust gases from said pattern to maintain stability of said pattern, whereby the circumference of said pattern increases in direct proportion to the velocity of heated air flow and hence expands into the area between the level of the upper extent of said access opening and said flue opening to divert the flow of air entering said access opening downwardly to the level of fuel support.

4,131,106

ENERGY SAVING FIREPLACE

Stanley Rusinek, Jr., and George Spector, both c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Sep. 30, 1976, Ser. No. 728,467
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **2 Claims**



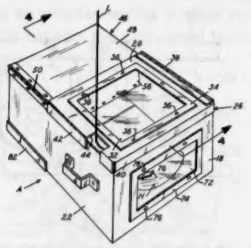
1. An energy saving fireplace heater comprising in combination, a cradle placable into a fireplace and consisting of a series of generally C-shaped pipes in parallel spaced apart relation, each said pipe comprising a horizontal lower leg, a vertical leg and an upper horizontal leg with bends therebetween, an end of said lower leg being inserted into an air manifold connected to an air duct leading outwardly of a house, said duct being intercepted by a motor-driven fan having controls for variable speed, each said lower leg of each said pipe being supported above the fireplace floor by a leg near a rear end thereof, and the ends of said pipe upper legs extending into a room at various angular positions, said manifold being located outside the fireplace on the room floors wherein said ends of said pipe upper legs are all retained in a common supporting plate, wherein a valve is provided along each said pipe horizontal lower leg including an outlet directing air toward a fire upon said cradle, said valve comprising a sleeve slidingly mounted over a perforated portion of said lower leg and including a handle extending beyond the manifold into the room for controlling the amount of air directed upon the fire.

4,131,107

DEVICE FOR MELTING ICE AT A FISH HOLE IN THE ICE

Emil E. Godbout, 200 Douglas Rd., Carlton, Minn. 55718

Continuation of Ser. No. 715,985, Aug. 19, 1976, abandoned. This application Feb. 13, 1978, Ser. No. 877,000
Int. Cl.[2] F23C *3/00*
U.S. Cl. 126—271.2 R **4 Claims**



1. A device for melting ice at a fish hole comprising:

(a) an enclosure having first and second sidewalls connected to

(b) first and second end walls,

(c) a cover for the enclosure including a first partial cover hingedly connected at one edge to a portion of said first sidewall,

(d) a second partial cover hingedly connected at one edge to a portion of said second sidewall with an edge thereof abutting an edge of said first partial cover,

(e) said second partial cover having a baffle plate connected thereto at a right angle along one edge thereof and extended into the enclosure when the cover is closed upon the enclosure,

(f) said second partial cover having a heat shield carried by said cover and spaced therefrom,

(g) means hingedly connecting said end walls at each edge to each end of said side walls,

(h) said first partial cover having an opening adjacent to and extending through the edge thereof and adapted to receive a fish line for extension therethrough to a hole in ice on which the device is positioned,

(i) a partial bottom hingedly connected at one edge to said first end wall and beneath and substantially in alignment with said second partial cover adapted to receive heating means upon the inner surface thereof,

(j) said first partial cover having an opening formed therein for viewing an ice hole in line therewith and adjacent said partial bottom.

4,131,108

ANDIRON FOR SUPPORTING LOGS

Edward M. Bauder, 3807 E. Georgia St., Burnaby, B. C., Canada (V5C 257)

Filed Jan. 17, 1977, Ser. No. 759,876
Int. Cl.[2] F24B *13/00*
U.S. Cl. 126—298 **10 Claims**

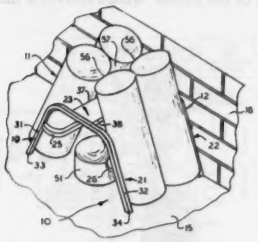
1. An andiron for supporting on a hearth first and second primary fuel banks in an inverted V-position, the andiron having:

(a) a baffle member spaced at a baffle height above the hearth and having spaced generally horizontally disposed first and second edges which define a baffle width of between about 25 and 50% of the baffle height,

(b) spaced first and second positioning members positioned below the baffle member and spaced laterally relative to each other and the baffle member,

(c) frame means connecting the baffle member to the positioning members so as to form a self-supporting framework having at least one open end, and in which the baffle

member and the first positioning member on one side of the frame are positioned so that the first fuel bank extends between the first edge of the baffle member and the positioning member and is inclined to the vertical at an angle of inclination, and the second positioning member on the opposite side of the frame is positioned relative to the



second edge of the baffle member so as to support the second fuel bank on the opposite side of the frame at a similar angle of inclination,

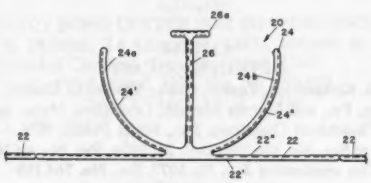
so that when correctly supported on the andiron, the fuel banks form a generally inverted V inclined at the angle of inclination.

4,131,109

SOLAR COLLECTOR

DeWayne Coxon, and Gary N. Bregg, both of Cedar Springs, Mich., assignors to Jordan College, Cedar Springs, Mich.

Filed May 25, 1977, Ser. No. 800,336
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **2 Claims**



1. A solar collector assembly comprising:

a housing having a tray and a radiant energy transmitting cover thereover; and a series of solar collector elements side-by-side in said tray, each said element comprising an elongated metallic extrusion having the following features:

an elongated base having an underside support surface and an upper radiant energy absorbing surface;

an elongated, generally T-shaped, radiant energy absorbing collector projecting upwardly above said base;

a pair of elongated arcuate generally quarter-cylindrical reflector members projecting upwardly and outwardly from said base astraddle of said collector, having concave inner reflector surfaces oriented generally toward said collector to reflect radiant solar energy to said collector, and having convex outer surfaces.

4,131,110

SOLAR ENERGY ABSORBER

J. Paul Jones, Jr., 644 Valley View La., Wayne, Pa. 19087

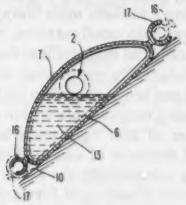
Filed Jan. 6, 1977, Ser. No. 757,487
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **9 Claims**

1. For a solar energy collector:

an elongated, thin wall, hollow, plastic tank extending along a horizontal axis to be filled with a heat absorbing fluid, the wall of the tank being capable of absorbing solar energy and conducting the same to said fluid in contact with the wall;

fluid inlet means adjacent one end of the tank and spaced inwardly from the periphery of the tank;

fluid outlet means adjacent the opposite end of the tank and spaced inwardly from the periphery of the tank; and



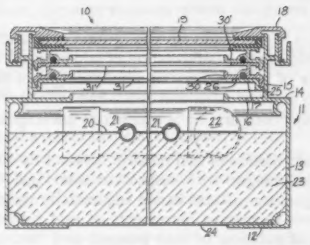
the spacing of the inlet and outlet means with respect to the periphery of the tank and the horizontal orientation of the tank providing that without flow of fluid thru the inlet to the tank and with the outlet being open to discharge fluid, the portion of the tank below the inlet and outlet means retains a substantial reservoir of fluid to maintain the temperature of the plastic below its deformation temperature.

4,131,111

SOLAR ENERGY COLLECTOR

Thomas P. Hopper, Durham, Conn., assignor to Sunworks, Inc., Guilford, Conn.

Filed Feb. 28, 1977, Ser. No. 772,972
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **7 Claims**



1. In a solar energy collector which comprises side and end walls defining a housing, an absorber within said housing, the improvement comprising a support ledge extending inwardly from said wall members above the absorber and below said cover member, a removable rectangular frame member having a thin transparent flexible sheet of material secured thereto and tensioned thereacross, said frame member resting on the support ledge, and cooperating means on said support ledge and said frame member for positioning and retaining said frame member in position on said support ledge.

4,131,112

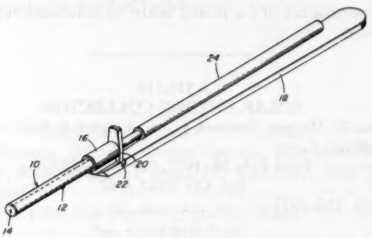
PROBE FOR OBTAINING SAMPLE OF CERVICAL MUCUS

Louis Kopito, Brookline; Samuel R. Schuster, Wellesley, and Harold Kosasky, Brookline, all of Mass., assignors to Ovutime, Inc., Brookline, Mass.

Filed Dec. 21, 1976, Ser. No. 753,007
Int. Cl.[2] A61B *10/00*; A61M *1/00*
U.S. Cl. 128—2 B **3 Claims**

1. A device for retrieving cervical mucus, said device comprising:

(a) a first handle;
(b) a second handle;
(c) a barrel having a rigid main body configuration and a rigid forward tip configuration, said rigid main body configuration and said rigid forward tip configuration being substantially continuous with respect to each other, said barrel being affixed to said first handle;
(d) a plunger having a resilient main body configuration and a resilient forward tip configuration, said resilient main body configuration and said resilient forward tip configuration being substantially continuous with respect to each other, said plunger being affixed to said second handle;
(e) said plunger being reciprocable within said barrel and the general diameter of said rigid main body configuration and the general diameter of said resilient main body configuration being substantially the same;
(f) the major portion of said rigid forward tip configuration of said barrel being relatively deep;
(g) the major portion of said resilient forward tip configuration of said plunger being relatively shallow;
(h) a cavity being defined between said resilient forward tip configuration of said plunger and said rigid forward tip configuration of said barrel such that, in a plane through



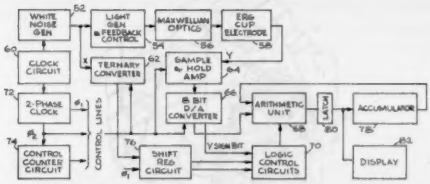
the axis of said rigid tip configuration of said barrel and said resilient tip configuration of said plunger, a line at the surface of said resilient tip configuration of said plunger has no point of inflection and a line at the surface of said rigid tip configuration of said barrel has no point of inflection;
(i) forward motion of said resilient forward tip configuration of said plunger with respect to said rigid forward tip configuration of said barrel sequentially causing contact between successive increments of said resilient forward tip configuration of said plunger and successive increments of said rigid forward tip configuration of said barrel;
(j) withdrawal of said resilient forward tip configuration of said plunger with respect to said rigid forward tip configuration of said barrel sequentially causing separation of successive increments of said resilient forward tip configuration of said plunger and successive increments of said rigid forward tip configuration of said barrel;
(k) whereby fluid in said cavity is maintained as an integral mass as it flows through said aperture;
(l) said cavity being variable between a positive volume and a substantialy zero volume.

4,131,113
ERG ANALYSIS SYSTEM

Derek H. Fender, Altadena, and Arthur J. Koblasz, Sierra Madre, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Aug. 19, 1976, Ser. No. 716,025
Int. Cl.[2] A61B *3/00*
U.S. Cl. 128—2 T **10 Claims**

1. Apparatus for enabling the examination of the eye of a subject for determining the existence of medical problems, comprising:
means for generating white-noise electrical signals,
a light source,
means for modulating said light source with said white-noise electrical signals to produce modulated light,
means for applying said modulated light to the eye of a subject to cause the generation of ERG signals by the eye in response thereto, including means for correcting for the impedance of the device which converts the band-limited



white-noise voltage signals into quasi-random intensity modutions,
means for deriving said ERG signals from the eye,
computer means for cross correlating said white noise electrical signals and said ERG signals for producing h_1 and h_2 kernels representative of the retinal system, and
means for displaying said h_1 and h_2 kernels wherefrom the existence of medical problems can be determined.

4,131,114
ORTHOPEDIC CAST

Harold B. Kirkpatrick, Easton, Conn.; Edward C. Distler, Warminster, Pa., and Marvin Menzin, Lexington, Mass., assignors to Reichhold Chemicals, Inc., White Plains, N.Y.

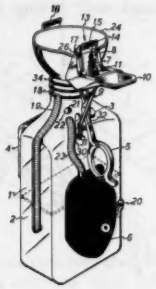
Division of Ser. No. 536,254, Dec. 24, 1974, Pat. No. 4,020,832.
This application Jan. 31, 1977, Ser. No. 764,199
Int. Cl.[2] A61F *13/04*
U.S. Cl. 128—90 **1 Claim**

1. In combination, a spool, an orthopedic bandage comprising a flexible carrier of liquid pervious material wound on itself about said spool, and a minimal but adequate coating on said bandage of a curing solid-resin forming liquid composition comprising a mixture of 100 parts by weight of methylene diphenyl diisocyanate, 50 parts by weight of the reaction product of glycerine and propylene oxide having an average molecular weight of approximately 260, dibutyl phthalate as a plasticizer and from about 0.03 to about 0.30 parts by weight of dibutyl tin dilaurate as a catalyst, whereby said carrier becomes rigid throughout upon completion of said curing.

4,131,115
EYELIDS-TURNING AND EYE-WASHING FIXTURE

Sung S. Peng, No. 46 Lane 31, Alley 81, Sec. 2, Taipei, Taiwan

Continuation of Ser. No. 724,773, Sep. 20, 1976, abandoned. This application Oct. 17, 1977, Ser. No. 842,969
Int. Cl.[2] A61M 7/00
U.S. Cl. 128—249 4 Claims

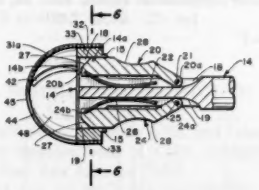


1. An eyelid-turning and eye-washing fixture comprising:
a bottle which is divided into a clean water container and a dirty water container;
a washing basin connected with said bottle;
spray means interconnecting said clean water container with said washing basin for causing the clean water in said container to spray out in said washing basin;
means for clipping and turning an eyelid affixed to said bottle and said washing basin.

4,131,116
ROTARY BONE CUTTER FOR SHAPING SOCKETS

John R. Hedrick, La Crescenta, Calif., assignor to Pevrick Engineering Company, Inc., Sun Valley, Calif.

Filed May 2, 1977, Ser. No. 792,935
Int. Cl.[2] A61B 17/32, 17/18
U.S. Cl. 128—305 8 Claims

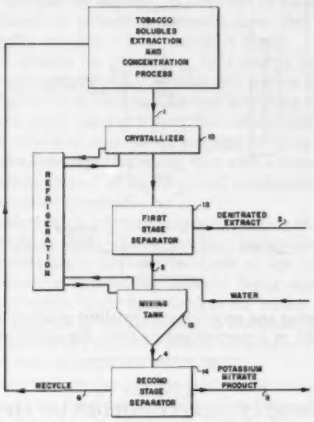


1. A bone cutter for shaping a socket comprising:
a shaft adapted to be selectively rotated at one end;
a cutter head comprising a hemispherical portion having a hemispherical exterior surface and containing a hollow chamber;
means located at the opposite end of said shaft for connecting said hemispherical portion to the opposite end of said shaft and for closing said chamber;
at least three elongate slots in a radial plane of said hemispherical portion connecting between said hemispherical exterior surface and said chamber, said slots coverging toward the center point of said hemispherical exterior surface but being unconnected to each other at said point; and
a cutting edge on the trailing portion of each of said slots and raised slightly above said hemispherical exterior surface of said hemispherical portion for moving material from said socket into said chamber during rotation of said shaft.

4,131,117
METHOD FOR REMOVAL OF POTASSIUM NITRATE FROM TOBACCO EXTRACTS

George F. Kite, Richmond; Grant Gellatly, Chester, and Richard G. Uhl, Highland Springs, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 21, 1976, Ser. No. 753,066
Int. Cl.[2] A24B 3/14
U.S. Cl. 131—140 C 1 Claim



1. In a process for preparing reconstituted tobacco, including the steps of providing an aqueous extract of tobacco plant part solubles, separating the insoluble fibrous tobacco residue from the aqueous extract, and forming said residue into a paper-like sheet, the improvement which comprises:
(a) concentrating the aqueous extract under vacuum to a total solids content between about 30–70 percent;
(b) cooling the extract to a temperature between about 5°–25° F. to effect crystallization of potassium nitrate;
(c) separating and recovering a crystalline potassium nitrate sludge and a denitrated extract phase; and (d) recombining the denitrated extract phase with the paper-like sheet of tobacco, wherein the said extract phase has a nitrate-nitrogen content of about 0.3–0.5 percent.

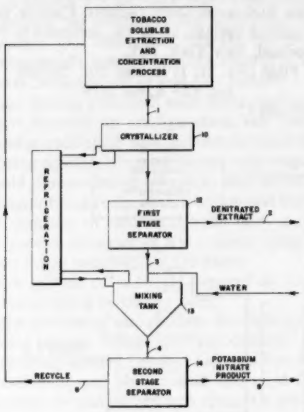
4,131,118
METHOD FOR REMOVAL OF POTASSIUM NITRATE FROM TOBACCO EXTRACTS

Grant Gellatly, Chester, and Richard G. Uhl, Highland Springs, both of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,448
Int. Cl.[2] A24B 3/14, 15/02
U.S. Cl. 131—140 C 4 Claims

1. In a process for preparing reconstituted tobacco, including the steps of providing an aqueous extract of tobacco plant part solubles, separating the insoluble fibrous tobacco residue from the aqueous extract, and forming said residue into a paper-like sheet, the improvement which comprises:
(a) concentrating the aqueous extract under vacuum to a total solids content between about 30–70 percent;
(b) cooling the extract to a temperature between about 5°–25° F. to effect crystallization of potassium nitrate;
(c) separating and recovering a crystalline potassium nitrate sludge and a denitrated extract phase;
(d) recombining the denitrated extract phase with the paper-like sheet of tobacco, wherein the said extract phase has a nitrate-nitrogen content of about 0.3–0.5 percent;

(e) forming a slurry mixture of the crystalline potassium nitrate sludge of step(c) with water; and



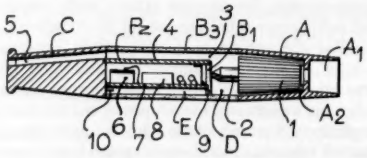
(f) separating and recovering crystalline potassium nitrate of about 91 ± 6 percent purity from the slurry mixture.

4,131,119

ULTRASONIC CIGARETTE-HOLDER OR PIPE STEM

Claudine Blasutti, 83, rue de Champigny, Chennevières-sur-Marne, France (94430)

Filed Oct. 26, 1976, Ser. No. 735,278
Claims priority, application France, Jul. 20, 1976, 76 22075
Int. Cl.² A24F *13/02*; A24B *15/02*
U.S. Cl. 131—187 **8 Claims**



1. Cigarette-holder or pipe stem comprising an elongated body having an upstream end and a downstream end and containing an ultrasonic tobacco smoke treatment device comprising an elongated duct disposed eccentrically in relation to the longitudinal axis of the body having an inlet end to receive the products of tobacco combustion from the upstream end of said body and an outlet end to deliver treated products of combustion to the downstream end of the body, an ultrasonic vibration generator disposed in said duct to generate sound waves transverse to the direction of flow through the duct, said ultrasonic vibration generator comprising a piezoelectric ceramic element driven by an LED integrated circuit power oscillator, and a battery to energize said circuit, said ceramic element forming a portion of the wall of said duct.

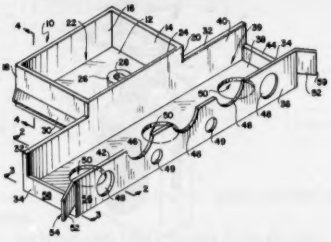
4,131,120

ASH TRAY

Ralph W. Edgar, 928 N. Vine, Orrville, Ohio 44667

Filed Nov. 18, 1977, Ser. No. 852,828
Int. Cl.² A24F *13/18, 19/10*
U.S. Cl. 131—235 R **11 Claims**

1. An ash tray comprising an ash receiving compartment, an adjacent compartment, said ash receiving compartment having a base and a pair of side walls and an end wall and a common wall upstanding therefrom, said pair of side walls and said end wall and said common wall defining an open mouth portion of said ash receiving compartment, means to slideably affix said ash receiving compartment to a panel of a motor vehicle, said adjacent compartment having a pair of end walls and said common wall and an opposed wall upstanding from a base portion affixed thereto, said pair of end walls and said common wall and said opposed wall defining an open mouth portion of said adjacent compartment, said base portion having a plurality of holes therein, said opposed wall having a plurality of holes therein, said opposed wall having a plurality of notches



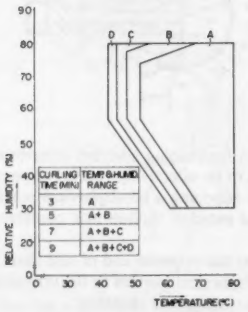
therein, hand grasping means affixed to said adjacent compartment for providing a finger grasping portion thereon, said open mouth portion of said ash receiving compartment being disposed located above said base of said ash receiving compartment, said open mouth portion of said adjacent compartment being disposed above said base portion, at least a portion of the marginal edge of said common wall defining said open mouth portion of said ash receiving compartment and said open mouth portion of said adjacent compartment.

4,131,121

METHOD AND DEVICE FOR SETTING CURLS IN HAIR

Masakatsu Araki; Shuhei Ochi; Toshio Kusunoki; Teizi Ishii, and Shinichi Sakata, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Mar. 18, 1976, Ser. No. 667,964
Claims priority, application Japan, Mar. 26, 1975, 50-36029
Int. Cl.² A45D *7/00*
U.S. Cl. 132—7 **14 Claims**



1. The method of curling hair comprising the step of applying an atmosphere of wet air prepared by simultaneously warming and humidifying air to rolled hair, wherein said atmosphere is within the range defined by respective temperature and relative humidity conditions of 47° C. and 80%, 47° C. and 62%, 62° C. and 30%, 80° C. and 30% and 80° C. and 80% for a minimum curling time of 3 minutes at a room atmosphere substantially of a temperature of 20° C. and a humidity of 40%.

4,131,122
UMBRELLA STRUCTURE

C. Robert Brooks, Great Neck, N.Y., assignor to 'Totes', Incorporated, Cincinnati, Ohio

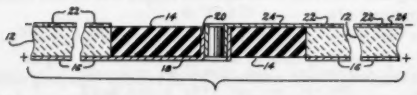
Filed Nov. 2, 1977, Ser. No. 847,844
Int. Cl.[2] A45B *9/04*
U.S. Cl. 135—76 3 Claims

1. An improved umbrella structure comprising
a centerpost having an umbrella cover fixed thereto at one end,
a rib structure connected between said centerpost and said cover, said rib structure being operable to open and close said umbrella as desired by a user,
a handle section fixed to said centerpost at the other end, said handle section defining a storage chamber therein,
a reversible pin having a stake-like point at one end and a connector at the other end, said connector being operable to connect said pin to said handle section in a stake position so that said stake-like point is exposed for staking said umbrella to ground and in a storage position where said stake-like point is seated in said storage chamber,
a cap engageable with said connector when said pin is in said storage position, said cap cooperating with said handle section to establish an aesthetically pleasing contour to said handle, said handle section and pin defining a generally linear axis in said stake position, and said handle section, said pin and said cap defining a generally linear axis in said storage position, and
a collar on said pin in combination with said connector, said collar serving to locate and to stop said pin in said stake position and in said storage position when in abutting relation with said handle section.

4,131,123
SOLAR CELL MODULE AND METHOD OF MAKING SAME

Richard P. Della-Vedowa, Granada Hills, and Ishaq M. Shahryar, West Los Angeles, both of Calif., assignors to Solec International, Inc., Los Angeles, Calif.

Filed Jan. 13, 1977, Ser. No. 758,930
Int. Cl.[2] H01L *31/04, 31/18*
U.S. Cl. 136—89 P 14 Claims



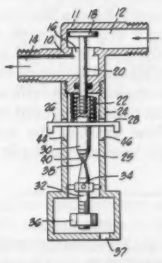
1. In a method of making a solar module for converting light energy to electrical energy comprising a plurality of solar cell wafers disposed in planar configuration within an electrical insulating flat spacing member, each wafer having a back face susbtantially entirely coated with electrical conducting material forming a positive terminal, and a front light receiving face with a coated collecting grid thereon formed of the electrical conducting material, forming a negative terminal, including the steps of:
(a) orienting uncoated wafers in spaced planar relation and between opposite faces of a spacing member having substantially the same thickness of the wafers,
(b) applying, in a single operation, electrical conducting material to the back faces of the wafers and to the spacing member in the form of first electrical connectors extending laterally from the wafers adapted to electrically connect with an adjacent wafer, and
(c) applying, in like manner, electrical conducting material to the front faces of the wafers, but in the form of grids, and to the spacing member, in the form of second electrical connectors extending laterally from the wafers to electrically connect with an adjacent wafer.

7. A solar module for converting light energy to electrical energy comprising a plurality of solar cell wafers disposed in planar configuration within an electrical insulating flat spacing member, each wafer having a back face substantially entirely coated with electrical conducting material forming a positive terminal, and a front light receiving face with a coated collecting grid thereon formed of the electrical conducting material, forming a negative terminal,
(a) said wafers being oriented in spaced relation and between opposite faces of the spacing member, the spacing member being substantially the same thickness of the wafers,
(b) the electrical conducting material being applied, in a single operation, to the back faces of the wafers and to the spacing member in the form of first electrical conductors extending laterally from the wafers adapted to electrically connect with an adjacent wafer, and
(c) the electrical conducting material being applied, in like manner, to the front faces of the wafers, but in the form of grids, and to the spacing member, in the form of second electrical conductors extending laterally from the wafers adapted to electrically connect with an adjacent wafer.

4,131,124
SEISMIC SAFETY CUTOFF DEVICE

Paul B. Sunde, 11356 Baird Ave., Northridge, Calif. 91324

Filed Nov. 26, 1976, Ser. No. 745,483
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—45 9 Claims



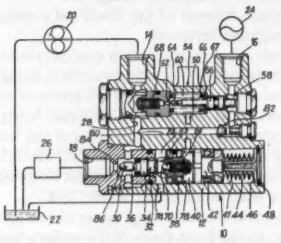
1. An improved seismic safety cutoff device for use with a valve of the type having a valve body structure and valve control stem for stopping the flow of a fluid in a conduit upon the occurrence of an external force produced by an earthquake or explosion, the improvement comprising:
(a) housing means adaptable for mounting on the valve body structure;
(b) stem-positioning means disposed within said housing means in operable association with the valve control stem for controlling the position of said valve control stem;
(c) resilient biasing means disposed within said housing means acting upon and urging said stem-positioning means and valve control stem to the valve-closed position;
(d) A substantially vertically-mounted pivotable rod disposed within said housing means in end-to-end contact with said stem-positioning means to retain the valve control stem in a valve-open position; and

(e) means responsive to a predetermined level of external force adjustably mounted on said pivotable rod for deflecting the pivotable rod upon application of an external force to said seismic safety cutoff device, thereby allowing the stem-positioning means and control stem to be displaced by the action of the resilient biasing means to the valve-closed position.

4,131,125
CHARGING VALVE FOR A FLUID PRESSURE ACCUMULATOR

Christian Tanguy, Frepillon, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed May 31, 1977, Ser. No. 802,218
Int. Cl.[2] G05D *16/10*
U.S. Cl. 137—118 **8 Claims**



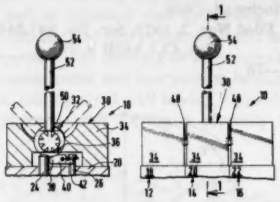
1. An accumulator charging valve comprising a housing having an inlet orifice connectible to the outlet of a hydraulic pump, a first outlet orifice connectible to the pressure chamber of a fluid accumulator, and a second outlet orifice connectible to an open-centre hydraulic circuit, said charging valve comprising a principal passage between the inlet orifice and the second outlet orifice, a principal movable valve mounted in the passage and operated by a differential piston having a face of diameter exposed to the pressure prevailing at the inlet orifice and a face of larger diameter projecting into a control chamber forming a resilient variable volume enclosure, a leakage passage between the inlet orifice and a low-pressure reservoir, the leakage passage having a first portion of restricted cross-section situated between the inlet orifice and the control chamber, and a second portion situated between the control chamber and reservoir and also containing an orifice of restricted cross-section, the first portion comprising pilot means for permitting or interrupting the flow through the leakage passage as a function of the pressure level prevailing in the chamber of the accumulator.

4,131,126
MECHANICAL ACTUATING MEANS FOR HYDRAULIC CONTROL VALVES

Karel Chromik, Schliern, Switzerland, assignor to H. Bieri AG Liebefeld, Liebefeld/Könitz, Switzerland

Filed Sep. 22, 1977, Ser. No. 835,742
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1976, 2646941
Int. Cl.[2] F16K *11/16, 31/524*
U.S. Cl. 137—270 **9 Claims**

1. Mechanical actuating means for hydraulic control valves assembled from individual units in a modular system, each of said control valves having a module housing and valve bodies adapted to occupy at least two control positions, and having valve body ends projecting from the module housings on the same side, said actuating means for each module comprising a cam housing adapted to be placed on the module housing and having a cam control member rotatably mounted and rotatable about an axis of rotation in said cam housing and which is adapted to be brought into engagement with said ends of said valve bodies for controlling the positioning of same, the axes of all of said cam control members being aligned with each other, and a coupling for the co-rotational joining together of the cam

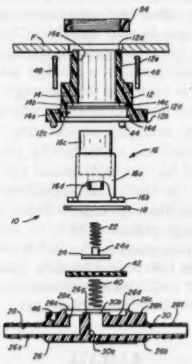


control members of adjacent modules in selectable relative angular positions to one another.

4,131,127
LOCKING VALVE

Jose V. Ferro, 3655 Glenhaven, Houston, Tex. 77025; Vincent M. Morales, 723 Cramer Ct., Katy, Tex. 77450, and Billy G. Reid, 1402 Avenue A, Houston, Tex. 77587

Filed Jan. 28, 1977, Ser. No. 763,319
Int. Cl.[2] F16K *35/06*
U.S. Cl. 137—384.6 **3 Claims**



1. A lockable valve for selectively prohibiting flow of fluid fuel from a fuel supply to a engine comprising:

a) a molded plastic housing means, including multiple housing components mutually aligned by male and female coupling means and held together by rivet means;

b) flow line receptacles, as integral parts of said housing means and equipped with anchoring shoulders, for receiving and anchoring flow line tubular members for conducting said fluid fuel from said fuel supply and to said engine, respectively;

c) a valve stem and a seat for selectively closing said valve for prohibiting flow of said fluid fuel to said engine;

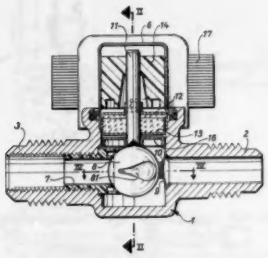
d) a diaphragm seal, anchored by an annular clamping means formed by two opposed annular lips to fluidtight seal said housing means, for selectively fluid-tight sealing said valve stem to said seat to selectively close said valve; and

e) locking means, held within said housing means by a snap ring and oriented by an arcuate flange cooperating with a keyed passage, equipped with plunger means carrying said valve stem, whereby said valve may be closed by depression of said plunger means from a first position to a second position, and opened only by unlocking said locking means to release said plunger means to return to said first position.

4,131,128
CONTROL VALVE

Rudibert Götzenberger, Neckarrems, Fed. Rep. of Germany, assignor to Ernst Flitsch GmbH U. Co., Fellbach, Fed. Rep. of Germany

Filed Apr. 1, 1977, Ser. No. 783,663
Claims priority, application Fed. Rep. of Germany, Apr. 7, 1976, 2615009
Int. Cl.[2] F16K *31/04, 5/10*
U.S. Cl. 137—556 **9 Claims**



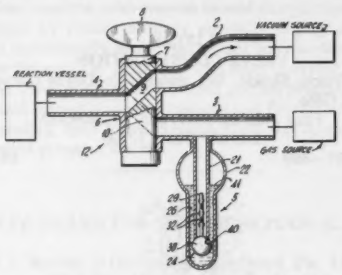
1. A control valve comprising:
(a) a casing defining an inlet conduit, a chamber, and an outlet conduit jointly constituting a flow path through said casing;
(b) an annular valve seat in said chamber formed with an opening therethrough, said flow path extending through said opening in a predetermined direction;
(c) a spherical valve member mounted in said cavity in movable engagement with said valve seat;
(d) operating means for moving said valve member about an axis transverse to said predetermined direction between two angularly spaced positions.
(1) the spherical outer face of said valve member being formed with a notch elongated in a plane perpendicular to said axis through the center of said valve member,
(2) said notch flaring in the direction of elongation thereof,
(3) said notch in one of said positions of said valve member communicating simultaneously with said inlet and outlet conduits,
(4) said notch in the other position of said valve member communicating with not more than one of said conduits; and
(e) yieldably resilient means in said cavity pressing said valve member toward said valve seat, said yieldably resilient means including,
(1) a pressure plate making contact with said circumference in said one position of said valve member substantially in a point only, and
(2) a spring interposed between said casing and said pressure plate.

4,131,129
DEVICE FOR CONTROLLING GAS FLOW INTO VESSELS

Raymond A. Firestone, 60 Hunter Ave., Fanwood, N.J. 07023

Filed Apr. 6, 1977, Ser. No. 785,036
Int. Cl.[2] F16K *17/02*
U.S. Cl. 137—596.12 **14 Claims**

1. A device for controlling gas flow into a vessel comprising:
(a) means for alternately connecting a vessel with a vacuum and gas source;
(b) a communicating means connecting said means with said gas source;
(c) a projection communicating with said communicating means and being open at its other end;
(d) a container enveloping at least a portion of said projection;
(e) a float within said container capable of sealing the open end of said projection;
(f) a liquid contained within said container and with its level above the open end of said projection; said liquid having a

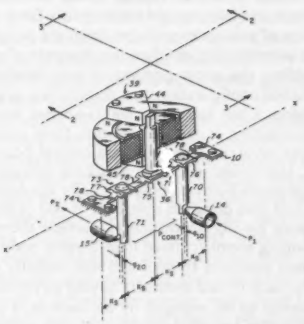


density such that it can urge the float into a sealing relationship with the end of said projection; and
(g) an exit means communicating with said container, said exit means being above the level of said liquid.

4,131,130
PNEUMATIC PRESSURE CONTROL VALVE

Joseph H. Ruby, Glendale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jul. 18, 1977, Ser. No. 816,837
Int. Cl.[2] G05B *11/48;* **F16K** *11/14*
U.S. Cl. 137—596.17 **9 Claims**



1. A signal responsive fluid pressure control valve for providing a controllable output pressure from first and second input pressure sources proportional to an electrical control signal with minimum fluid mass flow comprising
a valve housing including a controlled pressure chamber,
a first nozzle connected with said first pressure source and extending into said chamber,
a second nozzle connected with said second pressure source and extending into said chamber,
first and second flapper means adjacent said first and second nozzles respectively and defining first and second gaps therebetween, said flapper means being adapted to be moved relative to said nozzles to increase and decrease said gaps and thereby control the resultant pressure within said chamber in accordance with the relative positions of said flapper means,
electric torque motor and armature means adapted to move said flapper means in accordance with said electrical control signal, and
resilient means coupling each of said flapper means with said housing and with said armature means, said resilient means providing simultaneous movement of both of said flapper

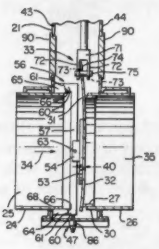
means by said armature means to simultaneously increase one of said gaps and decrease the other, and providing independent movement of one of said flapper means by said armature means when the gap defined by the other thereof is decreased to zero.

4,131,131

VALVE CONSTRUCTION

Paul P. Frisch, Skokie, Ill., assignor to Dayco Corporation, Dayton, Ohio

Filed Jun. 22, 1977, Ser. No. 809,133
Int. Cl.[2] F16K *37/00*
U.S. Cl. 137—559 **16 Claims**



1. A gate valve construction comprising; a valve body having an inlet and a circular discharge orifice; a flat flexible gate for said discharge orifice; means for supporting and moving said gate in front of and away from said orifice; said gate being adapted to be sealed against said orifice by upstream fluid pressure to define a dished configuration therein which is concave toward said inlet; a rigid back-up disc fixed against the central portion of said gate; said disc having a peripheral outline which is substantially less than the diameter of said orifice thereby enabling the outer portion of said flexible gate to define said dished configuration; and positioning means for said gate comprising, a bar having a central portion and a pair of projections extending in parallel relation from opposite ends thereof, means pivotally attaching said central portion to said backup disc, said means pivotally attaching including a pivot pin, said projections being disposed radially outwardly of said orifice with said gate disposed upstream of said orifice, each of said projections having a positioning surface thereon, and a pair of positioning members fixed in said valve body at diametrically opposed positions thereof and also radially outwardly of said orifice, each of said members having an inclined surface which is adapted to be engaged by an associated positioning surface, said inclined surfaces serving as cam surfaces which engage said positioning surfaces and position said bar and gate in front of said orifice while allowing free pivoting movement of said bar and gate about said pivot pin and also allowing unobstructed forming of said dished configuration.

4,131,132

MOUNTING BRACKET ASSEMBLY

Frank P. Zierden, Oak Creek, Wis., assignor to Zierden Company, Oak Creek, Wis.

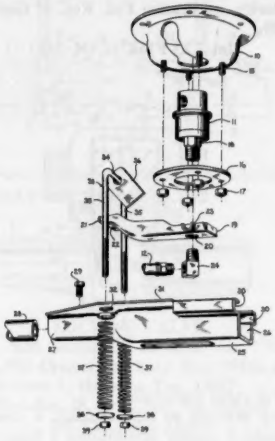
Filed Jan. 26, 1977, Ser. No. 762,505
Int. Cl.[2] B08B *3/02*; F17D *1/14*
U.S. Cl. 137—615 **5 Claims**

1. In a car washing apparatus in which water flows from an overhead swivel cartridge having a rotatable outlet to a car washing hose which is supported by a boom attached to the outlet, the improvement which comprises a mounting bracket assembly which permits the boom and hose to be rapidly and safely disconnected from the swivel cartridge, said mounting bracket assembly comprising:

(a) a hinge plate adapted to be connected at one end to the rotatable outlet of the swivel cartridge,

(b) a boom body member supporting a boom and a car washing hose, said body member having a hinge plate receiving recess,

(c) compression means which exert a compressive force to retain the hinge plate in the hinge plate receiving recess of the boom body member, and



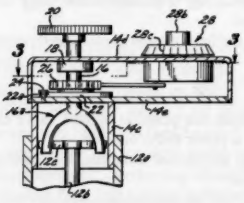
(d) jack means operatively connected with the compression means, said jack means being movable from an inoperable position to an operative position in which the jack means relieves the compressive force of the compression means so that the boom body member, boom and car washing hose can be readily disconnected from the swivel cartridge.

4,131,133

ADAPTOR FOR MANUAL LAWN AND GARDEN SPRINKLER VALVES

Donald D. Huwe, 17551 Orangetree La., Tustin, Calif. 92680

Filed Jun. 24, 1977, Ser. No. 809,793
Int. Cl.[2] F16K *31/48*
U.S. Cl. 137—624.11 **4 Claims**



1. Adaptor for manual lawn and garden sprinkler valves comprising in combination,

a housing formed with a cylindrical extension adapted to have a sliding fit with a sprinkler valve to thereby be the sole support for said housing on said valve, said sliding fit enabling said adaptor to be easily transferred from one sprinkler valve to another,

a manually rotatable shaft in said housing engageable with manual valve operating means on said sprinkler valve,

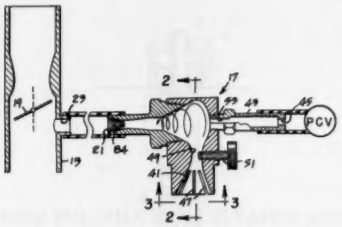
torsion spring means on said shaft such that rotation of said shaft to open said valve causes energy to be stored in said spring tending to rotate said shaft to closed position,

and a timer in said housing having an arm engageable with said shaft to prevent rotation thereof by said spring until a predetermined time interval has elapsed.

4,131,134
FLUID FLOW REGULATOR

John E. Lindberg, Berkeley, Calif., assignor to Owen, Wickersham & Erickson, San Francisco, Calif.

Filed May 4, 1977, Ser. No. 793,557
Int. Cl.[2] F15C 1/16
U.S. Cl. 137—808 12 Claims



1. A gas flow regulator for controlling the amount of gas flow through the regulator and comprising,

inlet means for admitting a gas into the flow regulator,

outlet means for conducting the gas flow from the regulator, and

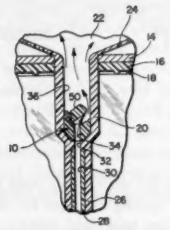
variable impedance means between the inlet means and the outlet means for producing an impedance to flow through the flow regulator and for varying that impedance as a function of the pressure differential across the variable impedance means and also varying that impedance as a function of acceleration in the gas flowing through the variable impedance means,

said variable impedance means having a configuration which produces an acceleration in the gas flowing through the variable impedance means.

4,131,135
ONE WAY CHECK VALVE CONSTRUCTION

Hans Peter Aleff, Old Sneech Pond Rd., Pole 188, R.D. 2, Cumberland, R.I. 02864

Filed Jul. 5, 1977, Ser. No. 813,216
Int. Cl.[2] F16K 15/14
U.S. Cl. 137—856 8 Claims



1. A valve adapted for positioning in a tubular passageway so as to permit the flow of fluid in one direction therethrough, said valve of one piece integrally molded plastic resinous composition and having a tubular body for fluid tight contact with the inner walls of said passageway, said body having a generally longitudinally orientated generally centrally disposed fluid receiving opening extending therethrough from a bottom surface thereof and terminating at an upper surface thereof, a molded plastic cover having first and second portions, said first cover portion hingedly connected to said body along one side thereof by a first hinge, said second cover portion hingedly connected to said first cover portion along an integral transversely extending second hinge connection proximal the upper surface of said body, said second portion having a lower face portion adapted for sealing contact with said upper body surface when said valve is disposed in said tubular passageway with outer surface portions of said first hinge contacting said passageway so as to rotationally upwardly bias said second portion about said second hinge against the natural plastic memory tendency of said second portion to assume its original as molded position with respect to said first portion, said second hinge by plastic memory normally urging said second portion downwardly against said upper body surface in sealing contact therewith so as to close said fluid receiving opening in a closed valve position, said second portion pivotally movable about said second hinge and towards said first cover portion to a non-sealing open valve position upon the application of a differential pressure thereto.

4,131,136
ROLLER GUARD FOR SWIMMING POOL CLEANING HOSES

Joseph J. Sawyer, P.O. Box 868, Longwood, Fla. 32750

Filed Oct. 11, 1977, Ser. No. 840,772
Int. Cl.[2] F16L 57/00
U.S. Cl. 138—110 2 Claims

1. A guard for swimming pool cleaning hoses comprising:

a spool having a hole extending axially therethrough and a concavity about the periphery thereof, said hole dimensioned so as to receive said hose;

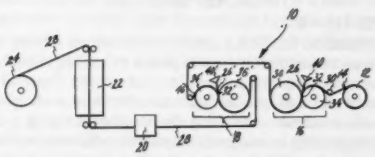
a plurality of roller segments based about said concavity and positioned therein;

means including a flexible shaft extending through all of said roller segments and about said concavity for rotatably supporting said roller means at the periphery of said spool, whereby said roller reduces frictional contact between said hose and a pool being cleaned; and wherein each roller segment comprises a cylinder with said shaft extending axially therethrough; and wherein each end of each cylindrical roller segment is beveled; and wherein said flexible shaft encircles said concavity; and wherein said hole is beveled outwardly away from the center of said spool; and wherein the specific gravity of said rollers is less than one.

4,131,137
COMPOSITE TUBULAR CASING FOR PROCESSED FOODS AND METHOD OF FABRICATING THE CASING

Stanley Lustig, Park Forest, and Ganapathy Vasudevan, Bolingbrook, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1976, Ser. No. 753,818
Int. Cl.[2] F16L 11/04
U.S. Cl. 138—118.1 5 Claims



1. A laminated composite tubular casing for covering a food

product adapted to be inserted therein and processed in situ, said composite food casing comprising:

a first substantially flattened tubular layer of a cellulosic material forming two sides bounded by two longitudinal edges;

a second substantially flattened tubular layer of a thermoplastic material forming two sides bounded by two longitudinal edges, said first tubular layer being enclosed within said second tubular layer with the longitudinal edges of said second layer being spaced apart from the longitudinal edges of said first layer and with each side of said second layer being bonded to the side of said first layer adjacent thereto; and

a beaded seam formed in said second layer extending the longitudinal length thereof proximate each edge and having a thickness greater than the thickness of said second layer and lying parallel to and separated from each longitudinal edge of said first layer by a predetermined lineal distance which averages above zero but no greater than about 0.003 inches over the longitudinal length of the casing.

4,131,138

HAND WEAVING LOOM

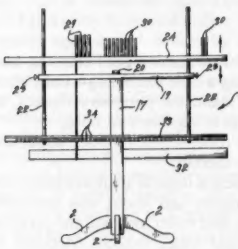
Guy Boisvert, 975 Belleville Ave., St. Vincent de Paul, Canada

Filed Nov. 1, 1977, Ser. No. 847,514

Claims priority, application United Kingdom, Nov. 3, 1976, 45697/76

Int. Cl.² D03D *29/00*

U.S. Cl. 139—29 **11 Claims**



1. A hand weaving loom comprising a base having a post, a work platen connected to the top of said post, pins removably secured to said work platen and upwardly projecting endwise therefrom in laterally spaced-apart relationship, said pins extending in a row along an edge of said work platen, each of said pins having a warp yarn holding means at the free end portion thereof remote from the work platen, rods downwardly projecting endwise from the work platen, and a warp yarn holder adjustably carried by said rods at a distance below said work platen.

4,131,139

GAS FILLING METHOD FOR GAS SPRING

Hisao Tanabe, Yokohama, Japan, assignor to Tokico Ltd., Kawasaki, Japan

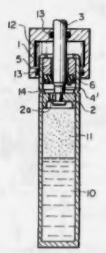
Filed Dec. 1, 1976, Ser. No. 746,639

Claims priority, application Japan, Dec. 10, 1975, 50/147604

Int. Cl.² B65B *3/04*

U.S. Cl. 141—4 **3 Claims**

1. A method for filling gas into a container having a piston therein and a piston rod on said piston extending out of one end of said container and an annular seal at said one end of said container through which said rod extends in sealing relationship, said method comprising the steps of forming a reduced diameter portion in said rod at a position adjacent to said piston and having a radial depth greater than that for accomodating said annular seal therein without deformation of said seal, moving the rod out of said one end of the container to the maximum extended position in which said reduced diameter portion is within said annular seal and said annular seal terminates short of the bottom of said reduced diameter portion for leaving a gas filling passage between the reduced diameter portion and said annular seal, said passage communicating the inside and outside of the container, filling a high pressure gas into the container through said passage while said annular seal remains undeformed, thereafter moving the rod inwardly for



bringing the unreduced diameter portion of the rod into sealing engagement with said annular seal to close said passage, and deforming a portion of the container positioned at a point along said container spaced from said one end to form a stop restricting the outward movement of the piston, thereby preventing the rod from moving to the maximum extended position wherein the seal ring and the reduced diameter portion of the rod have said gas filling passage therebetween.

4,131,140

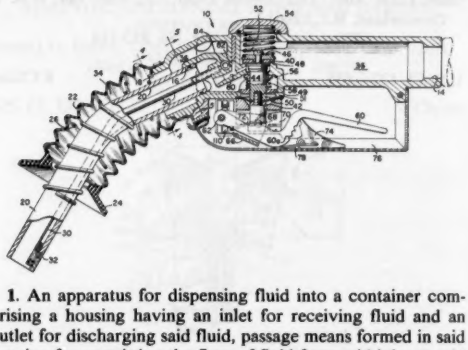
AUTOMATIC FLUID DISPENSING APPARATUS

Elmer M. Deters, Muscatine, Iowa, assignor to Wylain, Inc., Dallas, Tex.

Filed Dec. 28, 1977, Ser. No. 865,186

Int. Cl.² B65B *3/26*

U.S. Cl. 141—206 **17 Claims**



1. An apparatus for dispensing fluid into a container comprising a housing having an inlet for receiving fluid and an outlet for discharging said fluid, passage means formed in said housing for permitting the flow of fluid from said inlet to said outlet, said passage means comprising a first passage for permitting a direct flow of fluid from said inlet to said outlet and a second passage for receiving a portion of the fluid passing from said inlet to said outlet, means for creating a vacuum zone in said housing in response to the flow of fluid through said second passage, a valve member disposed in said housing and movable in said housing to open said passage, a lever assembly movable relative to said housing between a first position in which it can be manually actuated to move said valve member into said passage-opening position and a second position in which it cannot be manually actuated to move said valve member into said passage-opening position, means disposed in said housing and in engagement with said lever assembly for exerting a first force against said lever assembly to urge said lever assembly to said first position, means responsive to the

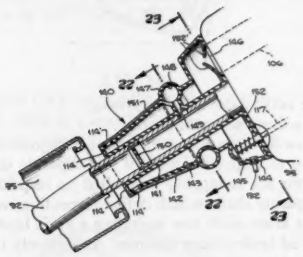
creation of said vacuum zone for exerting a second force against said lever assembly greater than said first force to urge said lever assembly to said second position, and means associated with said housing for sensing the absence of a predetermined fluid level in said container for relieving said vacuum and said second force so that said lever assembly is urged to said first potition.

4,131,141

CONTAINED VOLATILE LIQUIDS VAPOR RETENTION SYSTEM

Joseph Weissenbach, 373 S. Hoover St., Los Angeles, Calif. 90020

Continuation-in-part of Ser. No. 387,958, Aug. 13, 1973, Pat. No. 3,977,379. This application Jul. 1, 1976, Ser. No. 701,654
Int. Cl.² B65B *3/18*
U.S. Cl. 141—285 **8 Claims**



1. In a fuel tank system for receiving volatile fuel from a reservoir and for storing and dispensing said fuel to a tank for a combustion engine wherein the tank has walls forming a closed chamber, there being fuel conducting means from the reservoir, a discharge means for said chamber and a fill pipe on said tank having an inflow opening, and automatic nozzle means having a body in communication with the fuel conducting means, a spout extending from said body and an on-off trigger on said body normally biased to off position, a dispensing system including a combined fill mechanism and vapor return means in communication between the fuel conducting means and the tank, said dispensing system comprising a resilient annular muff adapted to seal within said fill pipe during a filling operation,

said muff comprising a vapor return passage having and inlet open to the interior of the fill pipe and an outlet open toward the reservoir,

said muff including flexible exterior and interior wall portions forming a resilient pocket, the exterior wall portion being compressible and adapted for temporary sealing engagement with the fill pipe, the interior portion being adapted to have a sealed engagement around said spout, said pocket comprising a portion of said vapor return means,

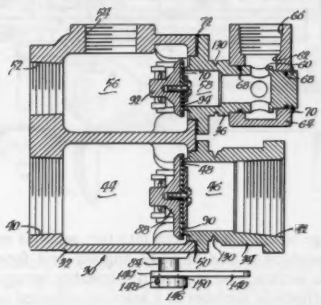
and a resilient trigger actuator in operating engagement with the trigger, said trigger actuator being mounted on a movable portion of said muff, said trigger actuator being responsive to movement of said movable portion of the muff upon engagement of the muff with the fill pipe when the muff is pushed into sealing position whereby to shift the resilient trigger actuator to on position.

4,131,142

SAFETY VALVE FOR FUEL DISPENSERS INCLUDING VAPOR RECOVERY SYSTEMS

Robert H. Barr, Dubuque, Iowa, and John D. Eckel, Hazel Green, Wis., assignors to A. Y. McDonald Mfg. Co., Dubuque, Iowa

Filed Apr. 22, 1977, Ser. No. 790,054
Int. Cl.² F16K *17/36*
U.S. Cl. 141—302 **6 Claims**



1. A safety valve for use in fuel dispensing systems including a vapor recovery system, said valve comprising:

a valve body;

first and second inlets in said body;

first and second outlets in said body;

first and second, separate, fluid flow passages in said body and extending between respective ones of said first and second inlets and outlets;

two valve seats in said body, one in each of said passages;

a shaft extending through and rotatable in said body adjacent said valve seats;

first and second clapper valves in said body, one in each passage, each clapper valve having a limited lost motion connection to said shaft to be rotatable therewith, with limited lost motion, between positions seated against and spaced from the associated valve seat;

a pair of means, one for each valve, biasing the associated valve towards its associated seat; and

means for normally holding said shaft in a position of rotation within said body wherein said valves are spaced from their associated seats and for sensing an unsafe condition in the vicinity of the valve body for releasing said shaft so that said biasing means will cause said valves to close.

4,131,143

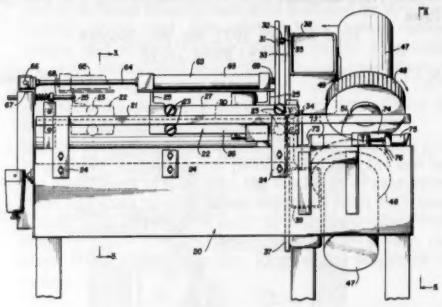
APPARATUS FOR CUTTING FLOOR TRUSS WEB COMPONENTS

George L. Mayo, Fort Worth, Tex., assignor to Speed-Saw, Inc., Corvallis, Oreg.

Filed Aug. 30, 1977, Ser. No. 829,056
Int. Cl.² B27M *3/08;* B26D *1/14*
U.S. Cl. 144—30 **24 Claims**

1. An apparatus for cutting truss web components and the like comprising a support base, a carriage guidably mounted on the support base for fore and aft movement on a linear path, a power actuator coupled with the carriage to move it forwardly and rearwardly on the support base, a workpiece clamp means on the support base for positioning and holding a workpiece across the path of movement of the carriage, a rotationally adjustable member on the carriage having its axis of rotation extending longitudinally of the carriage, means to limit the extent of rotation of said member in opposite directions and to releasably lock the member in selected adjusted positions, a pair of rotary cutter heads mounted on the rotationally adjustable member and movable with the carriage and member relative to a workpiece in the clamp means, means to indepen-

dently adjust each rotary cutter head in two directions on said rotationally adjustable member so that the rotary blades of said heads can be accurately positioned in offset and slightly overlapping relationship to enable the blades during movement of



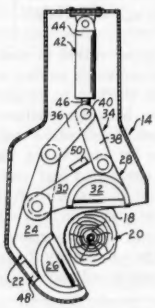
the carriage to cut a workpiece into two sections and simultaneously produce a pair of right angular end faces on each workpiece section, and means to releasably secure said rotationally adjustable member in a selected adjusted position.

4,131,144

TREE SHEAR ASSEMBLY WITH TOGGLE LINKAGE

Robert L. Fischer, New Lenox, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 29, 1976, Ser. No. 745,741
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—34 E **6 Claims**



1. Tree shearing apparatus comprising:

first blade means having a first blade movable between an open and a closed position for engaging and cutting one side of the body of a tree;

second blade means pivotally connected to the first blade means having a second blade operatively positioned in an opposed relationship to said first blade and moveable between an open position and a closed position for engaging and cutting another side of the body of a tree such that said blades are positioned substantially oppositely when in their respective closed positions;

a first link means;

a second link means pivotally connected to the first link means;

the first and second link means being pivotally connected to the first and second blade means, respectively, said second blade means being pivotally connected to said first blade means at a point between said first blade and the point whereat said first link means is pivotally connected to said first blade means;

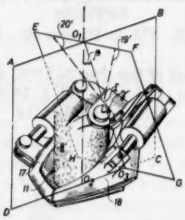
means connected to the first and second link means for applying force to the first and second link means, the first and second link means being positioned and connected to the first and second blade means so that application of force to the first and second link means applied force to the first and second blade means simultaneously said first and second blades from said open to said closed position to provide shearing of the body of a tree disposed therebetween.

4,131,145

TREE CUTTING DEVICE

Erich Puna, Gävle, Sweden, assignor to Brundell och Jonsson AB, Gävle, Sweden

Filed Aug. 11, 1977, Ser. No. 823,735
Claims priority, application Sweden, Jul. 1, 1977, 7707674
Int. Cl.[2] A01G *23/08*
U.S. Cl. 144—34 E **6 Claims**



1. A tree cutting device, comprising:

first and second separate shafts;

a pair of swingable arms having respective journalling means coupled to respective ones of said separate shafts so that said arms are swingably journalled on respective ones of said separate shafts which define respective swinging axes for said arms, each arm including a knife blade holder;

two curved knife blades mounted respectively to said knife blade holders of said arms;

power means coupled to said arms for moving said arms and said knife blades towards and away from each other;

each knife blade defining a portion of a surface of revolution, the center line of which coincides with the swinging axis of the respective arm on which the knife blade is mounted;

the axes of said separate shafts lying in a common plane that is inclined towards the center line of the trees to be cut; and

said separate shafts being arranged at an angle to each other so that their axes intersect at a point between the journalling means for said arms and the intersection between the common plane for said axes of said separate shafts and the center line of the maximum diameter tree to be cut.

4,131,146

HELICAL FLAKING HEAD WITH MULTIPLE CUTTING CIRCLE DIAMETERS

Peter Koch, Alexandria, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jun. 10, 1977, Ser. No. 805,370
Int. Cl.[2] B27C *1/00*
U.S. Cl. 144—221 **2 Claims**

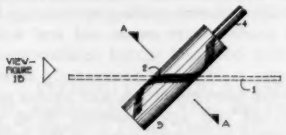
1. In a cutter head apparatus for milling a planar piece of lumber and simultaneously producing wood flakes therefrom the improvement wherein said apparatus comprises:

(a) a cylinder;

(b) means attached to said cylinder at one end to rotate said cylinder and to support said cylinders at an angle to the planar piece of lumber;

(c) a plurality of cutter knives mounted on the surface of said cylinder in a manner such that said cutter knives form a

plurality of uniformly spaced, parallel, continuous helicles around said cylinder, said plurality of cutter knives being characterized by a sequential and progressively increasing knife height relative the cylinder surface, said plurality of



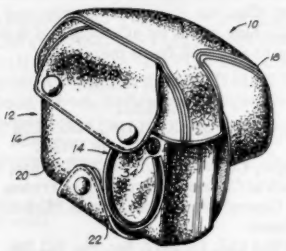
cutter knives being closely grouped in a manner such that at any given cross section of said cylinder the separation between the trailing edge of the highest knife and the leading edge of the lowest knife constitutes from about 3/6 to 5/6 of the cylinder periphery.

4,131,147

LENS CAP HOLDER FOR CAMERAS

Linus Schrage, 5201 S. Cornell, Chicago, Ill. 60615

Filed May 19, 1977, Ser. No. 798,334
Int. Cl.[2] B65D *85/38*
U.S. Cl. 150—52 J **6 Claims**



1. A device for preventing the loss of a lens cap for a camera, said device comprising a camera case of the ever-ready type having a body component and a front cover removably mounted thereon,

said body component of said case having a rear wall,

a generally circular lens cap having a ring-shaped mounting member with external screw threads thereon, and

a generally ring-shaped lens cap mount secured to the rear side of said rear wall on said body component of said camera case and projecting rearwardly from said rear wall,

said lens cap mount having a generally cylindrical opening with internal screw threads therein disengageably mating with said external screw threads on said lens cap for receiving and retaining the lens cap when not in use on the camera,

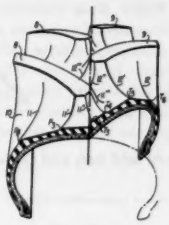
said lens cap mount being exposed on said rear wall and being fully and directly accessible for the direct and immediate mounting and removal of said lens cap on and from said lens cap mount.

4,131,148

PNEUMATIC TIRE FOR AGRICULTURAL AND INDUSTRIAL VEHICLES

Guido Bertazzoli; Roberto Gironi, and Angelo Resentini, all of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Mar. 22, 1976, Ser. No. 668,917
Claims priority, application Italy, May 22, 1975, 23652 A/75
Int. Cl.[2] B60C *11/08*
U.S. Cl. 152—209 B **6 Claims**



1. In a pneumatic tire for agricultural and industrial tractors, having a tread of the type comprising a plurality of lugs arranged in succession along the tire circumference in two contiguous series offset with respect to each other on the opposite sides with respect to the equatorial plane of the tire with tread surface portions therebetween, the lugs of each series extending obliquely from the tread lateral zone towards said equatorial plane and being longitudinally spaced apart from one another by a distance ranging between 1.5 and 6 times the longitudinal width of the lugs, the sides of said lugs showing a plurality of edges, the depth of the tread surfce between the lugs, measured with respect to the radially outer surface of said lugs, being substantially gradually decreasing from each lateral zone of the tread towards said equatorial plane, the tread comprising a plurality of corners extending at least on the tread portions between two adjacent lugs, the improvement wherein said corners form raised lines on said tread surface portions, said tread surface portions comprising a plurality of elementary flat surfaces and said corners constituting the junction line formed between every pair of contiguous flat surfaces, said continuous flat surfaces being radiused to one another, whereby each tire section taken with a plane either radial or parallel to the lugs of a series and intersecting the equitorial plane of the tire defines on said plane a profile which is constituted by a broken line of rectilinear lengths radiused to one another, each rectilinear length being the portion of said profile between two adjacent corners.

4,131,149

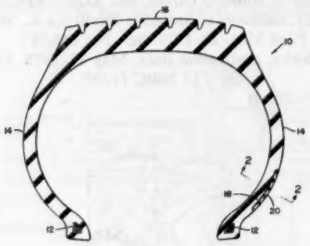
POLYURETHANE TIRE SIDEWALLS

Durward T. Roberts, Jr., Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 589,153, Jun. 19, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 753,074
Int. Cl.[2] B60C *9/14*
U.S. Cl. 152—357 A **7 Claims**

4. The method of coating a pneumatic tire having polyurethane in the surface exposed at a sidewall which method comprises (1) applying to said surface a colored coating composition comprising an elastomeric NCO-terminated polyurethane

prepolymer and a curing agent therefor wherein said NCO-terminated polyurethane prepolymer reacts with free —OH and



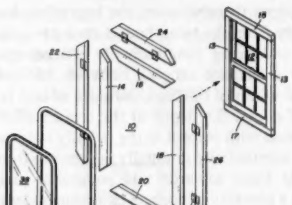
—NH in the surface of said tire, and (2) heating to effect said reaction.

4,131,150

ZIPPER-TYPE WINDOW FOR HOMES

Edythe A. Papadakis, 1323 Willow Rd., Baltimore, Md. 21222

Filed May 16, 1977, Ser. No. 797,077
Int. Cl.[2] E06B *3/30*
U.S. Cl. 160—368 R **3 Claims**



1. A zipper-type window insulating system for a window to be insulated, comprising:

a wall frame means surrounding said window to be insulated, said wall frame means consisting of a pair of side panels, a top panel, and a bottom panel, each said panel interfacing with adjacent panels to completely surround said window, a fastening means for affixing said wall frame means permanently to the interior wall surface around said window and any existing interior window casings, header and apron of said window;

a sealing means to seal said wall frame means to said interior wall surface, said sealing means being inserted between said wall frame means and said interior wall surface before said fastening means is used to permanently affix said wall frame means to said interior surface, said sealing means interfacing with the entire length of all said panels of said wall frame means, said fastening means holding both said wall frame means and said sealing means together and affixed tightly to said interior wall surface;

a solid and transparent window convering means, said window covering means being disposed over the interior surface of said window to be insulated and spaced therefrom, said window covering means extending beyond the perimeter of said window to be insulated to the approximate center of said panels that make up said wall frame means, a first reinforcement means affixed to and for reinforcing said window covering means along the outer periphery thereof, and a zipper element affixed to the periphery of said window covering means and said first reinforcement means, an adhesive fastening means for permanently affixing said window covering means, said first reinforcement means, and said zipper element to each other;

an attaching means for attaching said window covering means to said wall frame means, said attaching means consisting of a zipper member and a second reinforcement means, said zipper member being sandwiched between said second reinforcement means and said wall frame means to which both said second reinforcement means and said zipper member are permanently affixed by a second adhesive fastening means, said second reinforcement means and said zipper member being disposed around the entire wall frame means at the approximate center of the exposed face thereof and affixed thereto, said window covering means having been disposed over the interior surface of said window is attached to said wall frame means by connecting said zipper element of said window covering means to said zipper member of said attaching means to said wall frame means be engaging and operation of the zipper element around the periphery of said window covering means and the zipper member around the periphery of said wall frame means, said window covering means thereby being removably attached to said wall frame means to insulate said window; and

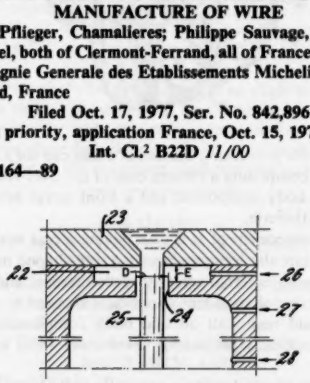
a decorative covering means for said attaching means attaching said window covering means to said wall frame means, said decorative covering means consisting of a decorative panel means having a pair of side decorative panels, a top decorative panel, and a bottom decorative panel, each said decorative panel configured on the ends thereof to removably fit together with each adjacent said decorative panel to form a framelike decorative covering of a size and configuration to removably cover said means attaching said window covering means to said wall frame means, each said decorative panel affixed to the outermost edge of each corresponding said panel of said wall frame means by a hinged means connected to each said decorative panel and to each corresponding said panel of said wall frame means, whereby said decorative covering means is enabled to effect the removable covering and uncovering of said attaching means for attaching said window covering means to said wall frame means.

4,131,151

REACTIVE GASEOUS COOLING MEDIUM FOR THE MANUFACTURE OF WIRE

Bernard Pflieger, Chamalieres; Philippe Sauvage, and Francis Tombrel, both of Clermont-Ferrand, all of France, assignors to Compagnie Generale des Etablissements Michelin, Clermont-Ferrand, France

Filed Oct. 17, 1977, Ser. No. 842,896
Claims priority, application France, Oct. 15, 1976, 76 31803
Int. Cl.[2] B22D *11/00*
U.S. Cl. 164—89 **11 Claims**



1. In a process for the manufacture of wire by projecting a jet of liquid steel which contains silicon and manganese through a nozzle into a cooling enclosure containing a reactive cooling medium which is a gaseous mixture having an oxidizing power with respect to the steel, the improvement which comprises controlling and limiting the oxidizing power of the reactive cooling medium by providing a gaseous mixture of an

inert gas and/or a reducing gas with a gas which is an oxidant with respect to the steel, at least in the zone adjacent to the orifice of the nozzle, so as to prevent the formation of iron and manganese oxides and/or silicates and permit the formation of silica alone at the thermochemical equilibrium corresponding to the temperature prevailing near the orifice of the nozzle.

4,131,152

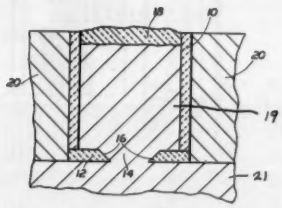
FEEDING UNIT FOR A CASTING

Ronald W. Ruddle, Cleveland, Ohio, and Frank Neat, Elora, Canada, assignors to Foseco Trading AG, Switzerland

Filed Dec. 30, 1976, Ser. No. 755,703

Int. Cl.² B22C *9/08*

U.S. Cl. 164—359 **1 Claim**



1. In a feeding unit including a breaker core and an insulated riser sleeve for a casting mold in foundry practice, said riser sleeve having a given inside diameter, the improvements comprising providing an opening in said breaker core of a size from 20% to 35% of said diameter, said breaker core having an opening defined by walls which include inwardly toward said opening and said breaker core having a thickness of from 5% to 20% of said diameter, and said casting molds being defined to produce a casting having a ranginess factor (R factor) in excess of 2.

4,131,153

ROLLER APRONS FOR A MULTIPLE STRAND BILLET- OR BLOOM CASTING INSTALLATION CONTAINING MORE THAN TWO STRANDS FOR THE CONTINUOUS CASTING OF METALS, ESPECIALLY STEEL

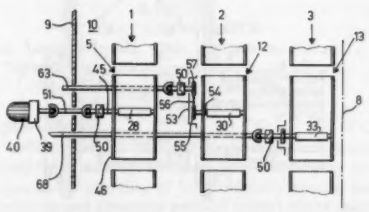
Markus Schmid, Zürich, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Apr. 11, 1977, Ser. No. 786,639

Claims priority, application Switzerland, May 19, 1976, 6250/76

Int. Cl.² B22D *11/12*

U.S. Cl. 164—442 **6 Claims**



1. A strand guide arrangement for a multiple strand billet or bloom casting installation working with more than two strands for the continuous casting of metals, especially steel, comprising;

a plurality of at least partially curved roller aprons for supporting the cast strands and extending in a casting direction, said roller aprons including inner roller aprons, neighboring roller aprons arranged on both lateral sides of said inner roller aprons and outer roller aprons, said outer roller aprons having only on one lateral side thereof a neighboring roller apron, each roller apron being subdivided into segments in said casting direction, each of said segments including rollers supporting the cast strand;

a power transmission shaft operatively connected to at least one of the rollers of each roller apron and

individual drive means connected to each respective power transmission shaft for driving said one roller said drive means being arranged substantially laterally outwardly of the other lateral side of at least one of said outer roller aprons;

each power transmission shaft which extends between a respective drive means and a respective roller of the inner roller aprons being arranged beneath one of the segments of the outer roller aprons and terminating at a location between the associated inner roller apron and its respective drive means whereby said one outer roller apron segment is removable from the casting installation without obstruction.

4,131,154

ROLLER APRON FOR A CONTINUOUS CASTING INSTALLATION FOR STEEL

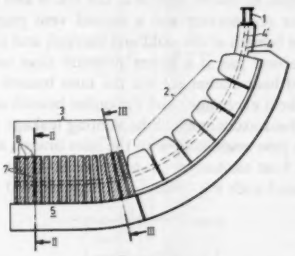
Raymond Vial, Lorette, France; Herbert Fastert, Wyckoff, N.J., and Heinrich Marti, Forch, Switzerland, assignors to Concast AG, Zürich, Switzerland

Filed Jul. 14, 1977, Ser. No. 815,664

Claims priority, application France, Jul. 16, 1976, 76 21829; Switzerland, May 13, 1977, 5992/77

Int. Cl.² B22D *11/12*

U.S. Cl. 164—448 **9 Claims**



1. A roller apron for a continuous casting installation, especially for casting steel, to support and guide a strand moving in a predetermined direction of travel, comprising:

a machine frame;

comb-like arranged guide means disposed to both sides of the machine frame;

pairs of successive rollers mutually displaceable independently of one another along said guide means;

said guide means being disposed transversely with respect to the direction of travel of the strand;

each of said rollers having bearings for supporting said rollers;

a respective transverse support at which there are mounted the bearings of each one of the two rollers of a roller pair;

said transverse supports cooperating with the comb-like arranged guide means;

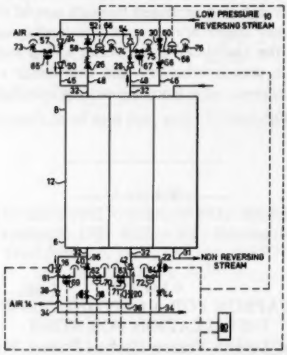
pressure cylinder means for moving said transverse supports; and

stop means provided at the machine frame against which there can be contactingly applied at least the transverse supports of non-driven rollers.

4,131,155
REVERSIBLE HEAT EXCHANGER OR REGENERATOR SYSTEMS

Robert M. Thorogood, London, England, assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 652,681, Jan. 27, 1976, Pat. No. 4,063,588.
This application Oct. 20, 1977, Ser. No. 843,816
Claims priority, application United Kingdom, Jan. 28, 1975, 3738/75
Int. Cl.[2] F28G *15/04, 9/00*
U.S. Cl. 165—1 3 Claims



1. A method of operating a reversible heat exchanger or regenerator system which method comprises the steps of passing a first gas through said heat exchanger or regenerator via an inlet branch at a first or warm end of said heat exchanger or regenerator and an outlet branch at a second or cold end thereof whilst venting leakage gas through a first vent pipe associated with an outlet branch at the warm end of said heat exchanger or regenerator and a second vent pipe associated with an inlet branch at the cold end thereof; and subsequently passing a second gas at a lower pressure than said first gas, through said heat exchanger via the inlet branch at the cold end of said heat exchanger and the outlet branch at said warm end of said heat exchanger whilst venting leakage gas through a third vent pipe associated with the inlet branch at said warm end of said heat exchanger or regenerator and a fourth vent pipe associated with the outlet branch at the cold end thereof.

4,131,156
FAN SHROUD

Albert W. Crumrine, Jr., Peoria; Theodore H. Fones, Washington; James M. Kostas, Peoria, and Raymond M. Vanderburg, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 12, 1976, Ser. No. 731,473
Int. Cl.[2] F28F *13/12*
U.S. Cl. 165—51 11 Claims

1. An improved fan construction for use with engines utilizing circulating liquid coolant and radiators, said fan construction comprising:

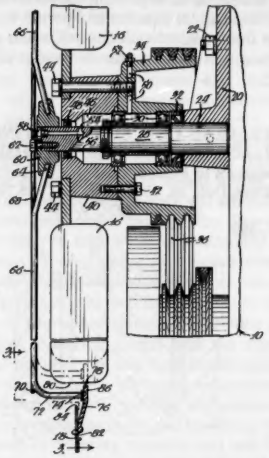
a shaft;

means secured to said shaft for mounting said shaft on an engine;

a sheave journalled on said shaft;

fan blades carried by said sheave and rotatable therewith;

a radially extending annular ring of elastomeric material about said fan blades and having an inner diameter spaced slightly radially outwardly of the tips of said fan blade and an outer periphery, the surface of said ring remote from said securing means being a sealing surface and extending generally radially of the shaft to slidably, peripherally, sealingly engage the exterior of a radiator shroud or the like about the periphery of an orifice therein; and

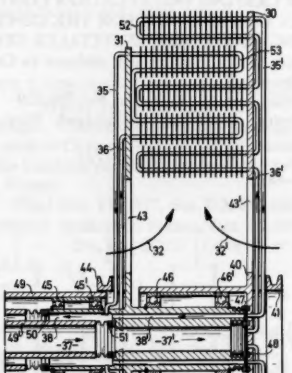


a perforate support for said ring, said support being secured to said ring and to said shaft, to fixedly position said ring inner diameter with respect to said tips.

4,131,157
ROTARY HEAT EXCHANGERS

Nikolaus Laing, Hofener Weg 35 bis 37, 7141 Aldingen bei Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 566,533, Mar. 10, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,193
Claims priority, application Australia, Mar. 18, 1974, 2225/74
Int. Cl.[2] F28D *11/02*
U.S. Cl. 165—86 4 Claims



1. Blower heat exchanger comprising first and second rotatable annular discs co-axially mounted with respect to each other, a plurality of axially spaced annular fins of a first diameter mounted on said first rotatable annular disc to form a first annular region and a plurality of axially spaced annular fins of a second diameter greater than said first diameter mounted on said first rotatable annular disc to form a second annular region radially spaced from said first annular region, a plurality of axially spaced fins of a diameter intermediate said first and second diameter mounted on the second rotatable disc to form

a third annular region extending into the radial space between said first and second annular regions, and axially extending heat exchanger tubes connecting the axially spaced annular fins of each annular region with the tubes of the annular regions associated with each disc being interconnected to form a tube system associated with that disc.

4,131,158

STORAGE ARRANGEMENT FOR THERMAL ENERGY

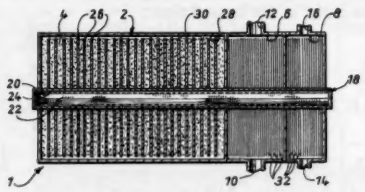
Ashok Abhat, Bombay, India, and Günther Neuer, Leinfelden-Echterdingen, Germany, assignors to Institut für Kerntechnik und Energiewandlung e.V., Stuttgart, Germany

Filed Jan. 19, 1977, Ser. No. 760,286

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602530

Int. Cl.² F23D *21/00*

U.S. Cl. 165—104 S **7 Claims**



1. A thermal storage arrangement comprising:
(a) a container bounding a chamber therein;
(b) a material in said chamber undergoing a phase transition between the liquid state and the solid state when at a predetermined temperature;
(c) a first heat exchanger and a second heat exchanger, each heat exchanger being formed with an intake port and a discharge port and defining a through passage connecting said ports for flow of a heating and cooling medium between said ports;
(d) an elongated, sealed tube having a first longitudinal portion in said chamber, and second and third longitudinal portions outside said chamber and in thermal contact with a medium flowing through the passages of said first and second heat exchangers respectively;
(e) a plurality of fins of thermally conductive material transversely projecting from said first portion into direct contact with said material; and
(f) a fluid in said tube, said fluid being partly liquid and partly gaseous at said predetermined temperature.

4,131,159

HEAT EXCHANGER

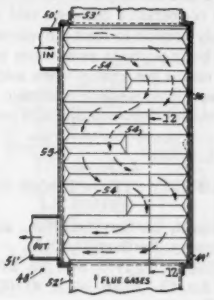
Wesley A. Long, Sylvania, Ohio, assignor to Karen L. Beckmann, Toledo, Ohio

Filed Jul. 26, 1976, Ser. No. 708,575

Int. Cl.² F28F *3/08*

U.S. Cl. 165—166 **4 Claims**

1. An indirect fluid-to-fluid heat exchanger comprising a core formed from a elongated sheet of metal having two opposed edges and a plurality of longitudinally spaced sections formed between and generally parallel to said edges, said sheet having pleat folds along a line between each two adjacent sections to define a first set of spaced fluid passages on one side of said sheet and a second set of spaced fluid passages on the other side of said sheet, said first and second passages alternating in said core, said edges defining ends of said core and said folds defining sides of said core, housing means enclosing said core and defining a side fluid inlet adjacent one end of said core and a side fluid outlet adjacent the other end of said core communicating with each passage in said first set and an end fluid inlet and an end fluid outlet communicating with opposed ends of each fluid passage in said second set, means sealing together adjacent edges of said sections defining each passage in said first set to prevent fluid flow between ends of said first and second passages, and corrugation means in each of said sections extending substantially normal to said flow passages so



as to define a sinuous flow path in each of said flow passages, and means in said first fluid flow passages causing said sinuous flow path in said first fluid passages to have a different direction from said sinuous flow path in said second fluid flow passages.

4,131,160

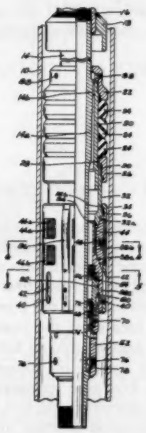
WELL TOOL WITH PRESSURE RESPONSIVE TIGHTENING MEANS

Chudleigh B. Cochran, Houston, Tex., assignor to Brown Oil Tools, Inc., Houston, Tex.

Filed Jul. 25, 1977, Ser. No. 818,583

Int. Cl.² E21B *33/128, 33/129*

U.S. Cl. 166—120 **23 Claims**



1. A well tool for use in a tubular well conduit, comprising:
a. a tool body comprising:
i. radially extendable means for engaging the well conduit; and
ii. first and second tool body portions operatively associated with said radially extendable means and relatively movable longitudinally toward each other to extend said radially extendable means, said first tool body portion having means associated therewith operative to resist movement of said first tool body portion with respect to the well conduit in a first longitudinal direction;
b. a mandrel assembly extending through said tool body and movable with respect to said first tool body portion in said

first direction, said mandrel assembly including means engageable with said second tool body portion to move said second tool body portion jointly with said mandrel assembly in said first direction whereby said mandrel assembly and said second tool body portion form an actuator to extend said radially extendable means;

c. lock means cooperative between said actuator and said first tool body portion to limit movement of said first and second tool body portions away from each other; and

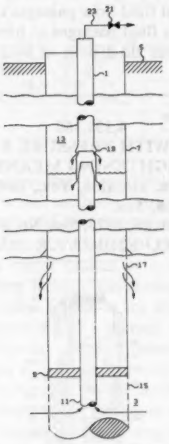
d. tightening means associated with said lock means for tightening said lock means responsive to fluid pressure acting in a second direction opposite said first direction.

4,131,161

RECOVERY OF DRY STEAM FROM GEOTHERMAL BRINE

Ralph G. Lacquement, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1977, Ser. No. 827,518
Int. Cl.[2] E21B *39/00, 43/00*
U.S. Cl. 166—265 **7 Claims**



1. An apparatus for recovering dry steam from geothermal brine comprising:

(1) a first pipe extending from the surface of the earth into a producing formation, said pipe closed at both ends and containing a second pipe of lesser diameter extending through the closed ends of said first pipe thereby forming an annular conduit between the pipes, said first pipe containing openings located in the pipe to be situated in the upper portion of said producing formation;

(2) said second pipe open at the lower end and at its upper end outside said first pipe terminated with a means for controlling flow therethrough; and

(3) a means for separation of brine from vapor, said means for separation located in said second pipe with means for discharging liquid into said annular conduit and passing vapor into the portion of said second pipe downstream of said means for separation.

5. A method for recovering dry steam from geothermal brine comprising:

(1) establishing flow of geothermal brine from a producing formation through the second pipe of an apparatus into a means for separation of brine from vapor located in said second pipe said apparatus comprising:

(a) a first pipe extending from the surface of the earth into a producing formation, said pipe closed at both ends and containing a second pipe of lesser diameter extending through the closed ends of said first pipe thereby forming an annular conduit between the pipes, said first pipe containing openings located in the pipe to be situated in the upper portion of said producing formation;

(b) said second pipe open at the lower end and at its upper end outside said first pipe terminated with a means for controlling flow therethrough; and

(c) a means for separation of brine from vapor, said means for separation located in said second pipe with means for discharging liquid into said annular conduit and passing vapor into the portion of said second pipe downstream of said means for separation;

(2) separating the vapor and brine in said means for separation;

(3) discharging separated brine into the annular conduit formed between the two pipes;

(4) returning said separated brine by gravity flow into the producing formation;

(5) directing separated steam into the portion of the second pipe that is downstream of the means for separation; and

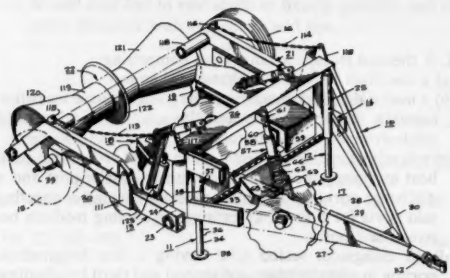
(6) recovering said steam through a flow control means at the outlet of the second pipe.

4,131,162

EARTH WORKING APPARATUS

James E. Schmitz, 521 Le Juene Rd., Orlando, Fla. 32808

Filed Dec. 11, 1975, Ser. No. 639,884
Int. Cl.[2] A01B *63/16, 15/16*
U.S. Cl. 172—138 **22 Claims**



12. An earth working apparatus comprising a main frame having means for detachably connecting said apparatus to a prime mover, a pair of support arms operatively connected to forwardly disposed ends thereof to said main frame for pivotal movement about a transverse axis, ground engaging wheels mounted on said support arms, a lift arm operatively connected to each of said support arms for pivotal movement about a second transverse axis, an earth working implement mounted on said lift arms, means interconnecting each of said lift arms and said main frame for permitting said lift frame to be angularly displaced relative to said support frame when the ground working implement is in contact with the ground thereby permitting the ground working implement to follow the contour of the ground, and means operatively interconnecting each of said support arms and said main frame for angularly displacing said support arms relative to said main frame whereby upon actuation of said displacing means said means interconnecting said lift arms and said main frame will function to angularly displace said lift arms relative to said support frames, correspondingly causing said earth working implement to be lifted out of a ground engaging position.

4,131,163

STUBBLE ERADICATING IMPLEMENT

Paul A. Bezzerides, 14092 Avenue 416, P.O. Box 211, Orosi, Calif. 93647

Filed Apr. 25, 1977, Ser. No. 790,332
Int. Cl.[2] A01B *35/18*
U.S. Cl. 172—145 **3 Claims**

1. An implement for use on an earth surface having a ridge

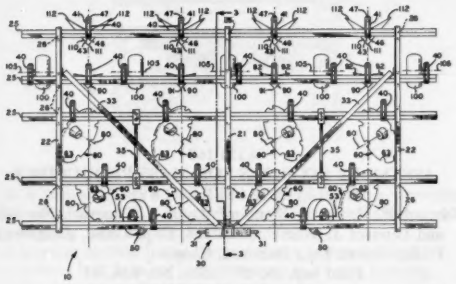
with debris including stubble disposed thereon and debris receiving furrows along opposite sides of the ridge, comprising:

(A) a frame;

(B) means mounting the frame for travel along the ridge;

(C) a pair of concavo-convex disk blades each concentric to a respective axis and each having a peripheral cutting edge;

(D) means mounting the blades for free rotation about their respective axes in fore and aft spaced relation along the ridge on opposite sides thereof, the axes being disposed in respective vertical planes substantially equally and oppositely angularly forwardly convergent with the ridge at from approximately 48° to 60° and said axes being forwardly inclined in their respective planes at from approximately 25° to 35° with their concave sides forwardly and upwardly disposed to scoop up debris and soil and deposit them in the furrows, said disk blades overlapping transversely of the ridge and having lowermost points adjacent



to the center of the ridge and being in sufficient proximity that soil and debris encountered by the forwardmost blade are scooped up and rolled laterally in one direction where while still moving they encounter the forward edge of the following blade and in part are scooped up and rolled oppositely laterally of the ridge;

(E) a first furrowing shovel mounted on the frame in following relation to the blades and in alignment therewith to form a first furrow along the ridge and to discharge soil oppositely laterally onto the debris and soil in the furrows;

(F) a roller mounted on the frame rearwardly of the first shovel in alignment with each furrow for compacting rolling engagement with debris and soil deposited therein; and

(G) a second furrowing shovel mounted on the frame rearwardly of the first furrowing shovel and in alignment with the disk blades to form a furrow along the ridge and to discharge soil oppositely laterally onto the compacted debris and soil in the furrows to form an elevated seed bed therealong.

4,131,164
ADAPTIVE VALVE CONTROL SYSTEM FOR AN IMPACT DEVICE

Wilmer W. Hague, Fayetteville, and Charles W. Frame, Chambersburg, both of Pa., assignors to Chambersburg Engineering Company, Chambersburg, Pa.

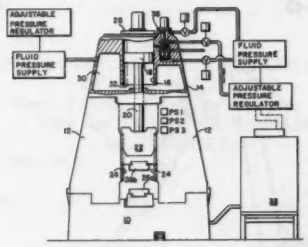
Filed Nov. 23, 1977, Ser. No. 854,022

Int. Cl.² F15B *21/02*

U.S. Cl. 173—1 **10 Claims**

1. In a stroke control system for an impact device having a frame supporting at least one cylinder, a piston within said cylinder and means connecting said piston to a ram such that said ram is repeatedly movable relative to said frame from a retracted position to impact position, a driving fluid system, including a fluid supply and valve means connecting said fluid supply to a port into said at least one cylinder at a position in the cylinder to cause the fluid to drive said ram into impact position, and operating means for controlling said valve means, an improvement whereby the valve means is opened consistently when the piston in the ram driving stroke has just uncovered said port so that each successive blow of the ram is of consistent energy, comprising:

signal generating means producing a distinctive signal when the ram, in its return stroke, reaches each of a plurality of pre-selected positions, each defining the beginning of a time zone;



timing means connected to said signal generating means and responding to the respective signals to initiate time counting, measuring time from first generation of the distinctive signals that are produced; and

logic means connecting to and responding to the timing means and signal generating means to actuate said operating means if predetermined times in each zone are reached.

4,131,165
HAMMER DRILL

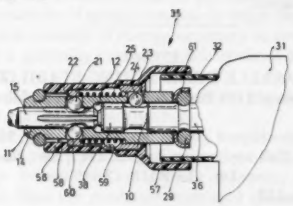
Karl Wanner, Echterdingen; Manfred Bleicher, Leinfelden, and Jörg Falchle, Bempflingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 14, 1977, Ser. No. 777,056

Claims priority, application Fed. Rep. of Germany, Apr. 28, 1976, 2618596

Int. Cl.² E02D *7/02*; B23B *5/34*

U.S. Cl. 173—48 **19 Claims**



1. In a hammer drill, a combination, comprising a movable tool having a longitudinal axis and a first end portion; a driving element substantially coaxial with said tool, said driving element having a second end portion adjacent said first end portion and directly transmitting axial impacts from said driving element to said tool without transmission of torque; a tool holder surrounding said first and second end portions and transmitting torque from said driving element to said tool without transmission of axial impacts, said tool holder including a sleeve-shaped element coaxially surrounding said first and said second portions and having a longitudinal axis, said sleeve-shaped member being axially movable relative to and connected for joint rotation with said tool and said driving element; drive means for driving said driving element; and means for absorbing axial impacts of said sleeve-shaped member and including an O-ring located in an annular groove provided on the outer surface of said driving element, and a cup-shaped element axially and radially embracing said O-ring.

4,131,166

PILE DRIVING DEVICE

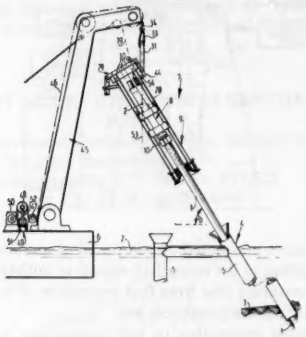
Hans G. Schnell, Hamburg, Fed. Rep. of Germany, assignor to Van Kooten B.V., Naarden, Netherlands

Continuation of Ser. No. 594,238, Jul. 9, 1975, abandoned. This application Jan. 6, 1977, Ser. No. 757,284

Claims priority, application Netherlands, Jul. 26, 1974, 7410148

Int. Cl.[2] E02D *7/06*

U.S. Cl. 173—43 **14 Claims**



1. A pile driving device for driving a pile particularly into a soil located beneath a body of water, said device being adapted to be suspended from the hanger of a lifting device and comprising, a hammer, a guide frame for guiding said hammer, and suspension means for suspending the guide frame to a lifting device, said guide frame including a base piece surrounding the pile to be driven with a sliding fit and at least one guide stay fastened to said base for guiding the hammer, said suspension means engaging the hanger of the lifting device in a vertical plane of suspension extending transversely of the guide frame and located near the center of gravity of the pile driving device; and a head fastened to at least one guide stay of the guide frame, said head having a plurality of fastening areas for a suspension bracket.

4,131,167

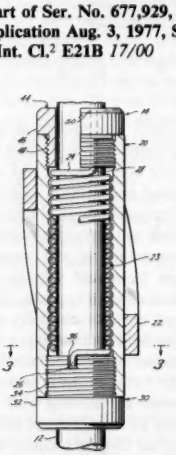
RELEASABLE DRILL STRING STABILIZER

Vernon T. Richey, 1111 Blalock, Apartment 160, Houston, Tex. 77055

Continuation-in-part of Ser. No. 677,929, Apr. 19, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,570

Int. Cl.[2] E21B *17/00*

U.S. Cl. 175—323 **16 Claims**



1. A stabilizer adapted to be releasably positioned on a drill collar for use in a drill string positioned in a well bore and above a drill bit which comprises:

an elongate tubular body;

spring means having upper and lower ends, connected to said tubular body;

first means for anchoring one end of said spring means with the drill collar;

second means for anchoring the remaining end of said spring means after said spring means has been wound around the drill collar on which the stabilizer is to be positioned sufficiently tight to functionally grip the drill collar thereby fixedly and releasably positioning and connecting said tubular body to the drill collar.

4,131,168

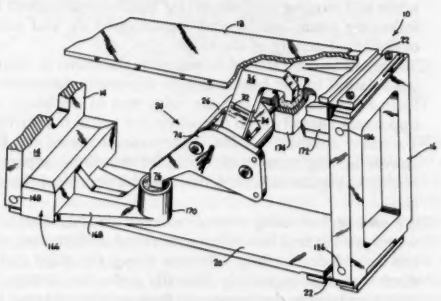
ASSEMBLY FIXTURES FOR MASS PRODUCIBLE WEIGHT MEASURING SYSTEM

Edward R. Hordeski, Stamford; Louis T. Canevari, Norwalk, and Leonard J. Macari, Stamford, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sep. 26, 1977, Ser. No. 836,761

Int. Cl.[2] G01G *21/00*

U.S. Cl. 177—128 **10 Claims**



1. A fixture to facilitate assembly of a weight measuring system for determining the weight of an article, the system including a scale assembly, the assembly comprising a frame link, a load support link, and means providing displacement of the load support link with respect to the frame link as a function of the weight of an article, the system further including an optical detector adapted to measure load support link displacement, the detector comprising a light source adapted to generate a light beam, photodetector means positioned at the end of the light beam, an optical grating, the grating being carried by the detector and positioned between the light source and the photodetector means, the fixture comprising means adapted to position the frame link with reference to a vertical base plane and a horizontal base plane, means adapted to position the load support link with reference tod the vertical base plane and the horizontal base plane and means adapted to independently position the grating with reference to the vertical base plane and the horizontal base plane to thereby facilitate anchoring the grating to the frame link by potting whereby the grating may be preadjusted with respect to the base planes.

4,131,169
MOUNTING FOR TRACTION MEMBER WITH LATERAL STEP-DOWN TRANSMISSION

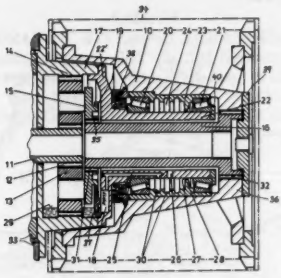
Jurgen Eickhoff, Tettnang, and Bernhard Binger, Ravensburg, both of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed Jun. 22, 1977, Ser. No. 808,988

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1976, 2629362

Int. Cl.² B62D *55/12*

U.S. Cl. 180—9.62 **10 Claims**



1. A mounting for a traction member of a vehicle provided with a frame and with an engine-driven power shaft, projecting laterally from said frame, comprising:

a housing on said frame surrounding said power shaft;

a hollow hub forming a rigid extension of said housing;

a trunnion coaxially surrounding said hub;

a pair of axially spaced journal bearings rotatably supporting said trunnion on said hub, said trunnion and said hub being separated by an annular clearance between said bearings;

transmission means in said housing drivingly connecting said power shaft with said trunnion;

conduit means forming a closed path for the circulation of a lubricant between said housing and said clearance; and

pump means in said housing operatively coupled with said transmission means for circulating said lubricant along said path, said trunnion forming a thermally conductive wall around said clearance whereby the circulating lubricant is cooled upon passing through said clearance.

4,131,170
TRACTOR HAVING DUAL SIDE-BY-SIDE ENGINES

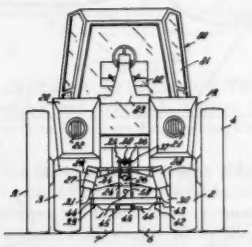
Cornelis van der Lely, 7, Brüschenrain, Zug, Switzerland

Filed May 6, 1976, Ser. No. 683,940

Claims priority, application Netherlands, May 12, 1975, 7505526

Int. Cl.² B60K *17/28*

U.S. Cl. 180—53 FE **47 Claims**



1. A tractor which comprises at least two forward and at least two after ground engaging wheels, said forward ground engaging wheels being spaced apart, a lifting device mounted on the tractor between said forward spaced-apart wheels, a pair of spaced-apart engines for propelling the tractor mounted directly over said forward spaced-apart wheels in substantially the same vertical longitudinal corresponding planes whereby one of said engines is mounted over each of said spaced-apart wheels, an operator's seat and controls for the tractor mounted completely behind the space defined between said engines whereby the visibility of said lifting device to an operator of the tractor seated in said seat is substantially unobstructed.

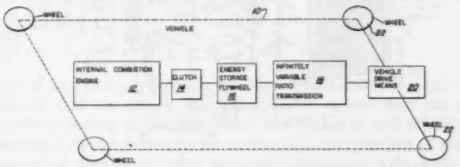
4,131,171
LOW ENERGY CONSUMPTION VEHICLE PROPELLED BY THERMAL ENGINE

John H. Keyes, P.O. Box 474, Nederland, Colo. 80466

Filed Apr. 11, 1977, Ser. No. 786,547

Int. Cl.² B60K *9/00*

U.S. Cl. 180—54 R **22 Claims**



1. A method of simultaneously reducing fuel consumption in a vehicle propelled by a thermal engine and reducing the amount of pollutants emitted by the thermal engine, comprising the steps of:

providing an energy storage flywheel having an operational capability of accumulating sufficient energy for generally supplying intermittent high energy requirements for propelling the vehicle,

positioning the energy storage flywheel within the vehicle,

continuously operatively connecting the energy storage flywheel to the thermal engine during vehicle operation,

continuously operating the thermal engine to produce energy to be utilized in propelling the vehicle during operation,

regulating the thermal engine to generally produce a maximum quantity of energy marginally larger than that predetermined quantity of energy necessary to propel the vehicle at a generally constant predetermined and maximum speed,

directly delivering energy produced by the thermal engine to the energy storage flywheel,

accumulating a quantity of energy by the energy storage flywheel over a predetermined period of time sufficient to supply intermittent quantities of energy significantly greater than the maximum regulated quantity of energy supplied from the thermal engine,

selectively removing quantities of energy from the energy storage flywheel a predetermined time after the energy produced by the thermal engine has been delivered to the flywheel, and

utilizing at least part of the energy selectively removed from the energy storage flywheel for propelling the vehicle.

4,131,172
ACCESS PANEL FOR ENCLOSURES

Kenneth C. Wolfgram, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

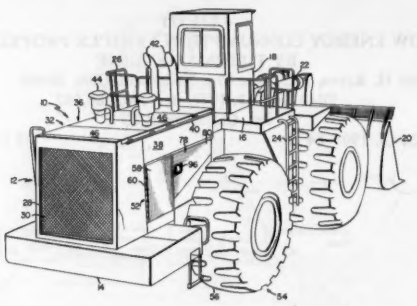
Filed Jul. 11, 1977, Ser. No. 814,593

Int. Cl.² B62D *25/10*

U.S. Cl. 180—69 R **14 Claims**

1. In a wheeled vehicle having an engine compartment, an enclosure for said compartment including a top wall and a vertically disposed side wall, an access opening for said compartment in said side wall, access to said opening being impeded by positionment partially behind an obstructing wheel of said vehicle, an access panel for selectively closing or open-

ing said access opening, said access panel including a first panel section and a second panel section, said panel sections being vertically hingedly adjacently interconnected and forming a composite unit with the sections being pivotal with respect to one another, vertical hinge means at one end of said composite unit hingedly connecting said composite unit proximate said opening and pivotally mounting said first panel section for pivoting about a vertical axis with respect to said opening, and



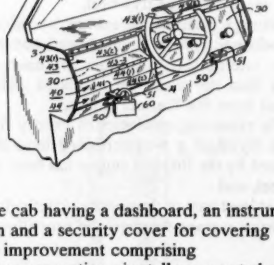
additionally pivotally mounting said composite unit for pivoting about a vertical axis with respect to said opening, the plural pivotal relationships permitting a compound pivotal movement of the individual sections with respect to one another, and of the compound unit to move said access panel in a plane horizontally from behind said obstructing wheel for optimally uncovering said access opening in the restricted operating area behind the access impeding wheel.

4,131,173

INSTRUMENT PANEL COVER FOR VANDALISM PROTECTION

Richard F. Boersma, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Oct. 25, 1977, Ser. No. 844,646
Int. Cl.² B60K *35/00*
U.S. Cl. 180—90 **10 Claims**



1. In a vehicle cab having a dashboard, an instrument panel mounted therein and a security cover for covering the instrument panel, the improvement comprising

a first pivotal cover section pivotally supported adjacent to the uppermost portion of the dashboard by a horizontally extending hinge, said first pivotal cover section extending downwardly from said hinged connection and bowed inwardly toward said instrument panel in a substantially concave cross-sectional contour to form a portion of an instrument panel security cover,

a second pivotal cover section pivotally supported from said first pivotal cover section by a second horizontally extending hinge, said second pivotal cover section extending downwardly from said hinged connection adjacent to the instrument panel to form a portion of the instrument panel security cover, and

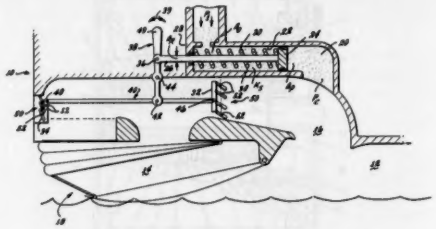
means for releasably securing said second pivotal cover section to the vehicle dashboard to maintain the instrument panel covered.

4,131,174

HEAVE ALLEVIATION AND CONTROL DEVICE FOR A SURFACE EFFECT SHIP

Michael A. Rickards, La Jolla, Calif., assignor to Rohr Industries, Incorporated, Chula Vista, Calif.

Filed Aug. 4, 1977, Ser. No. 821,694
Int. Cl.² B60V *1/11*
U.S. Cl. 180—118 **9 Claims**



1. Heave alleviation and control apparatus for a surface effect ship, said ship having pressurized central and stern seal plenum chambers with ducting therebetween, said apparatus comprising:

an opening between said stern seal plenum chamber and the atmosphere;

a first valve means positioned in said opening; and

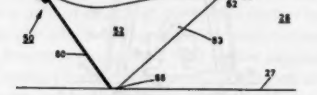
control means responsive to the pressure of said central plenum chamber including rigid valve connecting means for positively opening and closing said first valve means for maintaining a predetermined pressure in said stern seal plenum chamber.

4,131,175

AIR CUSHION VEHICLES

Raymond L. Wheeler, Cowes, England, assignor to British Hovercraft Corporation Ltd., Yeovil, England

Filed Jun. 16, 1976, Ser. No. 720,350
Claims priority, application United Kingdom, Jun. 20, 1975, 26413/75
Int. Cl.² B60V *1/16*
U.S. Cl. 180—127 **6 Claims**



1. An air cushion vehicle having cushion-containing means at least partly constituted by a flexible skirt comprising an inflatable bag member constructed from impermeable flexible sheet material fixed to the vehicle hard structure along fixing lines that are spaced apart and one of which is situated at a level above the other whereby in operation when the bag member is inflated the major portion of the inflated section of the bag member is situated outboard of a vertical plane through the upper fixing line and there is no flow of air through the bag member to build up and sustain the vehicle

supporting cushion, and a plurality of individual skirt elements, each element extending between attachment at a fixing line on the bag member and attachment at a fixing line on the underside of the vehicle hard structure so as to depend downwardly therefrom and terminate at a lower tip that is outboard of a vertical plane passing through at least the lower fixing line of the bag member to the vehicle hard structure, the dimension measured between the fixing lines of the skirt elements on the bag member and the vehicle hard structure being substantially larger than the dimension measured between the fixing lines of the bag member to the vehicle hard structure.

4,131,176

HYDRAULIC STEERING ARRANGEMENT

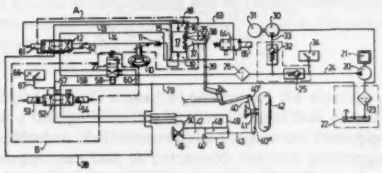
Manfred Ruoff, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 3, 1977, Ser. No. 848,086

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1976, 2652815

Int. Cl.[2] B62D *5/10*

U.S. Cl. 180—131 **12 Claims**



1. A hydraulic steering arrangement for the wheels of a vehicle to be manually or automatically controlled, comprising linkage means connected to the wheels of the vehicle; a source of pressure fluid; manually operable means comprising a first multiple position valve adapted to be connected in circuit with said source, said first multiple position valve being movable between a neutral position and two working positions, hydraulically operated servo means in circuit with said first multiple position valve and mechanically connected to said linkage means for controlling the position of the latter, and a manually operable steering wheel connected to said first multiple position valve for moving the same between the positions thereof to thereby control movement of said servo means; automatically operable means comprising a second multiple position valve adapted to be connected in circuit with said source of pressure fluid, said second multiple position valve being movable between a neutral position and two working positions, hydraulically operated cylinder-and-piston means in circuit with said second multiple position valve and also mechanically connected to said linkage means; and a reversing valve connected upstream of said first and said second multiple position valve to said source of pressure fluid and movable between a first position connecting said first multiple position valve to said source of pressure fluid and a second position connecting said second multiple position valve to said source.

4,131,177

DUAL STEERING SYSTEM FOR VEHICLES

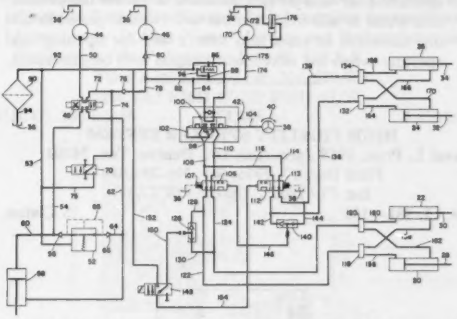
Edgar R. Goodbary, and Francis A. Bartley, both of Cardin, Okla., assignors to Goodbary Engineering Company, Cardin, Okla.

Filed Nov. 23, 1976, Ser. No. 744,431

Int. Cl.[2] B62D *5/08*

U.S. Cl. 180—133 **5 Claims**

1. A dual hydraulic steering system for steering wheels of off-highway vehicles and comprising pump means operably connected directly in the steering system and operable by a vehicle engine for supplying hydraulic fluid for the steering system, primary steering cylinder means operably connected with the steering wheels for steering thereof, and secondary steering cylinder means operably connected with the steering wheels for steering thereof independently of said primary steering cylinder means upon failure of the primary steering cylinder means for any reason, and wherein independent valve means is operably connected with the primary and secondary steering cylinder means for normally providing fluid energiza-



tion of said primary steering cylinder means and de-energization of said secondary steering cylinder means, said valve means including means responsive to a failure of said primary steering cylinder means for providing fluid energization of said secondary steering cylinder means and simultaneous de-energization of said primary steering cylinder means.

4,131,178

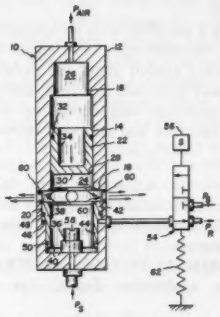
SEISMIC SOURCE FOR USE UNDER WATER

John V. Bouyoucos, Rochester, N.Y., assignor to Hydroacoustics, Inc., Rochester, N.Y.

Filed Nov. 30, 1977, Ser. No. 855,854

Int. Cl.[2] G01V *1/04*

U.S. Cl. 181—120 **14 Claims**



1. A seismic signal source for use under water which comprises

(a) a housing having a cylinder,

(b) a piston slidably disposed in said cylinder for travel in opposite directions and dividing said cylinder into first and second chambers on opposite sides of said piston,

(c) said second chamber having a gas trapped therein which is compressed when said piston travels in one of said directions,

(d) means for supplying pressurized water to said first chamber,

(e) a water jet forming aperture extending through said housing into said first chamber,

(f) a valve member slidably disposed in said first chamber in porting relationship with said jet aperture for opening said aperture to enable said piston to travel under the force of said compressed gas in the other of said directions to drive a jet of water through said aperture,

(g) said piston also being disposed in porting relationship with said jet aperture for closing said aperture after the

opening thereof by said valve member to terminate said jet and generate a vapor cavity in the water outside said housing, the collapse of which produces the seismic signal, and

(h) means for actuating said valve member to close said jet aperture after said jet is terminated to enable the pressurized water in said first chamber to drive said piston in said one direction to reset said source and for opening said aperture when the next seismic signal is to be generated.

4,131,179

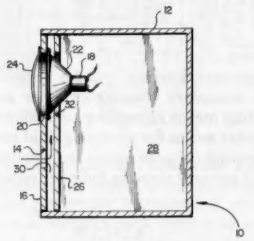
HIGH FIDELITY SPEAKER SYSTEM

Darrel L. Pope, 1918 Jacqueline Dr., Denton, Tex. 76201

Filed Dec. 17, 1976, Ser. No. 751,898

Int. Cl.[2] H05K *5/00*; G10K *13/00*

U.S. Cl. 181—156 **5 Claims**



1. A loudspeaker system comprising:

an enclosure, including a vent opening and a wall having a speaker opening;

a loudspeaker mounted at the speaker opening and having a speaker cone for generating air flow outside and inside the enclosure; and

means, including a partition with an aperture to receive the speaker cone therethrough, with edges of the aperture relatively closely spaced about the cone, for defining a first region away from said openings, and a second region adjoining the openings, said second region forming a duct between said aperture and said vent opening.

4,131,180

SPEAKER SYSTEM

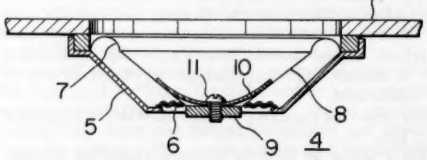
Yoichi Maeda, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1977, Ser. No. 778,998

Claims priority, application Japan, Apr. 12, 1976, 51-45258[U]

Int. Cl.[2] G10K *13/00*; H04R *7/00*

U.S. Cl. 181—163 **2 Claims**



1. A speaker system comprising an enclosure, a loudspeaker opening in said enclosure, a loudspeaker mounted over said loudspeaker opening, a further opening in said enclosure, a drone cone mounted over said further opening and driven by said loudspeaker, a first weight attached to the drone cone, a removable tuning weight, and fastening means removably fastening said removable tuning weight to the front side of said first weight and removable from the front side, said fastening means being frictionally attached to said first weight.

4,131,181

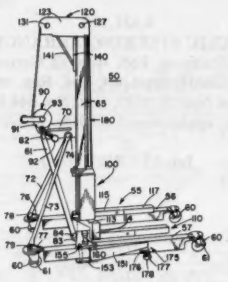
PORTABLE LIFT

Howard H. Vermette, No. 7 - 143rd St., Hammond, Ind. 46320

Filed May 16, 1977, Ser. No. 797,510

Int. Cl.[2] B66B *9/20*

U.S. Cl. 187—11 **7 Claims**



1. A portable lift comprising, a base, a single upright post supported on said base, a carriage surrounding said post slidably supported thereon, a pulley mounted on said carriage, a load supporting member connected to said carriage and extending forwardly of said post, a pulley unit as a single integrally formed structure comprising an elongated pulley housing and a pulley within said housing and a cable guide separate from said pulley extending through said elongated pulley housing, said pulley housing extendng rearwardly of said post forming a cantilever and supporting said pulley within said housing in substantial vertical alignment with said post, a winch supported on said post vertically intermediate said pulley housing and said base and extending rearwardly of said post, a cable connected to said winch and extending over said pulley in said pulley housing and extending forwardly and outwardly of said post and continuing downward around said pulley on said carriage then upwardly through said cable guide and thence downwardly to a connection point on said winch support rearwardly of said winch so that operation of said winch will through said cable cause said load supporting member to move up or down on said upright post, brace means coplanar with said upright post extending substantially from said connection point forwardly and downwardly to said base, spaced apart braces connected to said winch support near said upright extending rearwardly and downwardly toward the rear of said base, said brace means extending between said spaced apart braces, the portion of said cable extendng rearwardly of the post between said pulley and said winch in cooperation with said means connecting said winch support to said base providing a cantilever force which counter balances the force of the load at the front of the lift to permit lifting of loads twice the winch capacity.

4,131,182

SPEED PATTERN GENERATOR

Jerry D. Bass, Martinez, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 24, 1977, Ser. No. 827,399

Int. Cl.[2] B66B *1/30*

U.S. Cl. 187—29 G **7 Claims**

1. A speed pattern generator for manually operated construction elevator car controls, comprising:

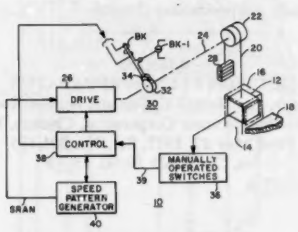
amplifier means having an input and an output, said amplifier means including a first operational amplifier,

integrating means having an input and an output, said integrating means including a second operational amplifier,

means connecting the output of said integrating means to the input of said amplifier means,

first pattern circuit means connected to the input of said amplifier means,

second pattern circuit means connected to the input of said integrating means,



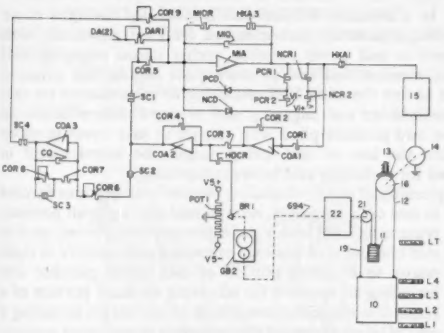
and control means for activating and deactivating said first and second pattern circuit means in a predetermined sequence to provide a speed pattern signal at the output of said amplifier means.

4,131,183

SPEED DICTATION APPARATUS

Otto A. Krauer, Tuckahoe, N.Y., assignor to Otis Elevator Company, New York, N.Y.

Filed Apr. 7, 1971, Ser. No. 131,989
Int. Cl.[2] B66B *1/28*
U.S. Cl. 187—29 R **5 Claims**



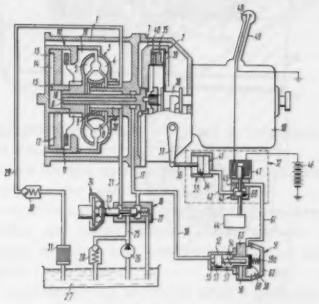
1. Speed dictation apparatus for an elevator car comprising a function generator generating a voltage which varies continuously as a function of time and controls the car's acceleration on each trip, a landing selector mechanism generating a voltage which varies continuously as a function of the distance the car is from the selected landing at which it is to stop on each trip, said latter voltage controlling the car's deceleration on each trip, signal generating means operating on each trip in which the car does not attain its rated running speed and generating a signal to stop accelerating in response to the selection of the landing at which the car is to stop, and control equipment connected to said function generator and said landing selector mechanism and receiving both said time controlled voltage and said distance controlled voltage, said control equipment operating in response to said signal to stop accelerating on any trip and causing said distance controlled signal to control the speed of said car from before the car starts its deceleration for that trip by initiating before deceleration starts a gradual transfer from control in which said time controlled voltage predominates to control in which said distance controlled voltage predominates.

4,131,184

VEHICLE HYDRAULIC TRANSMISSION

Leonid A. Rumyantsev; Jury K. Esenovsky-Lashkov, both of Moscow; Vasily T. Avershin, Brysansk; Vladimir Y. Ilnitsky, Brysansk, and Ivan L. Jurin, Bryansk, all of U.S.S.R., assignors to Tsentralny Nauchno Issledovatelsky Avtomobilny i Avtomotorny Institut Nami, Moscow and Proizvodstvennoe Obiedinenie "Baz", Bryansk, both of, U.S.S.R.

Filed Aug. 1, 1977, Ser. No. 820,688
Int. Cl.[2] F16D *47/06*; F16H *41/18*
U.S. Cl. 192—3.26 **3 Claims**



1. A vehicle hydraulic transmission comprising: a transmission clutch, a hydraulic torque converter, said transmission clutch and hydraulic torque converter being kinematically connected with each other; a direct drive clutch provided in said hydraulic torque converter for the purpose of locking together the impeller and turbine thereof; a vehicle engine shaft speed pickup, said direct drive clutch being actuated by hydraulic fluid pressure in response to a signal from said pickup; a transmission clutch engaging and disengaging arrangement having a power cylinder whose movable member is mechanically connected with the operating member of the transmission clutch, an air pressure source, and a positively controlled valve designed for the power cylinder to be alternately connected to said air pressure source and opened to the atmosphere through a throttling orifice; a valve arrangement connected through said positively controlled valve to the power cylinder for the latter to have a further provision for communication with the atmosphere, said valve arrangement being actuated by hydraulic fluid pressure in response to a signal from said vehicle engine shaft speed pickup.

4,131,185

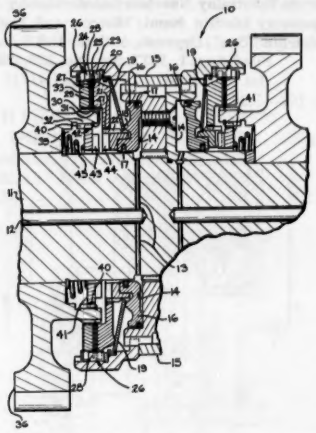
FRICTION CLUTCH SYNCHRONIZER WITH RESILIENT GEAR COUPLING

Myron M. Schall, Toledo, Ohio, assignor to Dana Corporation, Toledo, Ohio

Filed Jun. 3, 1977, Ser. No. 803,023
Int. Cl.[2] F16D *23/04, 25/061, 25/063*
U.S. Cl. 192—53 B **7 Claims**

1. A clutch assembly for engaging a first member and a second member comprising, a synchronization disc assembly operatively connected between said first member and said second member, a piston assembly positioned for applying force to said synchronization disc assembly for loading said disc assembly and urging said first and second members to approach synchronous rotation, said piston assembly mounting first set of gear teeth, said first set of gear teeth being mounted for rotation with said first member, a low mass body mounting a second set of gear teeth mateable with said first set of gear teeth, said low mass body being operatively connected for rotation with said second member, and means for urging said low mass body toward said first set of gear teeth, whereby upon actuation said piston assembly compresses said disc as-

sembly to urge said first member and said second member to approach synchronous rotation, actuation of said piston assembly causes said first set of gear teeth to contact said second set of gear teeth, said low mass body allows said second set of gear



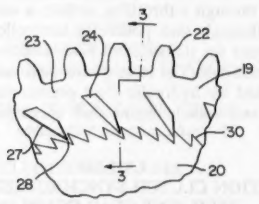
teeth to come into contact with said first set of gear teeth with a force that allows the gear teeth to slip against one another until synchronization of said first member and said second member is approached and the gear teeth mate in a positive full load relationship.

4,131,186

TIMER CONSTRUCTION AND CLUTCH CONSTRUCTION THEREFOR OR THE LIKE

Edgar E. Marquis, Newtown, and Joseph Discepolo, Waterbury, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 31, 1977, Ser. No. 829,453
Int. Cl.[2] F16D *11/10, 41/12*
U.S. Cl. 192—67 R **12 Claims**



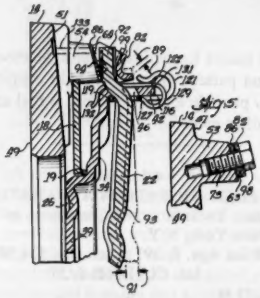
1. In a timer construction having a timer motor and a selectable time period means adapted to be interconnected to said timer motor by a clutch means to drive said time period means for a selected time period, said clutch means comprising a first rotatable member driven by said timer motor and having a plurality of teeth arranged in a ring-gear like circular array, and a second rotatable member being axially movable and having a plurality of teeth on the outer periphery thereof, said rotatable members each having an axis of rotation, said second member being operatively interconnected to said time period means and being adapted to have some of its said teeth mesh with at least some of said teeth of said first member to be driven thereby when said second member is axially moved into said circular array of said teeth of said first member, the improvement wherein each tooth of said first member comprises a leg having opposed ends of which one end thereof is secured to said first member and the other end thereof is disposed in cantilever fashion relative to said first member, each leg having a tooth face that extends between said ends thereof and is substantially flat, each said tooth face facing at an angle to said axis of rotation of said first member, each said tooth face having an inner edge that is angled relative to said axis of rotation of said first member, said first member having a flat surface disposed substantially perpendicular to said axis of rotation thereof, said legs being secured to said flat surface and extending substantially perpendicular thereto.

4,131,187

FRICTION CLUTCH APPARATUS

Grant H. Smith, and Ronald L. Carlson, both of Rockford, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed May 27, 1977, Ser. No. 801,176
Int. Cl.[2] F16D *19/00, 13/46*
U.S. Cl. 192—99 A **5 Claims**



1. In a rotatable friction clutch assembly having a cover member, a pressure plate mounted for axial movement with respect to said cover member, spring means engaging said cover member and said pressure plate urging said pressure plate in one direction, and retracting levers mounted on said cover member and engaging said pressure plate effective to move said pressure plate with respect to said cover member against the bias of said spring means, the improvement in means for mounting said levers comprising;

a plurality of axially extending chordal wall portions formed in said cover member, each of said chordal wall portions being associated with a respective retracting lever, each of said chordal wall portions extending substantially at right angles to a dished portion of said cover member and including an aperture for receiving an outer portion of a respective retracting lever, each of said levers including a pair of laterally spaced slots disposed in said outer portion; and

a plurality of retainer clips mounted on said cover member arranged for retaining said levers in assembly with said cover member, each retainer clip having a pair of bight portions embracing a respective chordal wall portion, each of said bight portions including a leg portion engaging a respective slot in its associated retracting lever whereby the associated retracting lever is retained in a selected radial position with respect to said cover member.

4,131,188

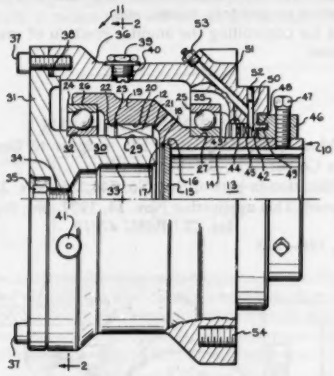
LUBRICATION ARRANGEMENT FOR A COUPLING DEVICE

Loris J. Charchian, Troy, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Dec. 8, 1976, Ser. No. 748,585
Int. Cl.[2] F16D *13/74*
U.S. Cl. 192—113 B **4 Claims**

1. A coupling assembly comprising an input driving member and an output driving member generally enclosing said input driving member being sealed therearound, said output driving

member forming a generally cylindrical housing said housing having an oil fill opening and plug on the cylindrical surface thereof, at least one oil fill level check opening and plug on the



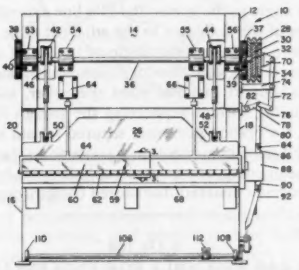
cylindrical surface and angularly displaced thereon relative to said oil fill opening and a vent on the face of said housing generally normal to said cylindrical surface and on the centerline thereof.

4,131,189

SAFETY APPARATUS FOR OPERATING CLUTCH ACTUATED, MOVABLE RAM MACHINES

Daniel R. Stephens, 7282 Judson Ave., Westminster, Calif. 92683

Filed Apr. 13, 1977, Ser. No. 787,290
Int. Cl.[2] F16P *3/10*; B30B *15/12*
U.S. Cl. 192—129 B **11 Claims**



1. In combination:

a frame;

first and second elements carried on said frame, each of said elements being mounted for movement relative to the other of said elements and to said frame;

first movement restricting means, operable upon movement of said first and second elements together in one direction in a given degree relative to said frame for restricting further movement of one of said elements in further degree in said one direction while permitting such further movement of the other element; and

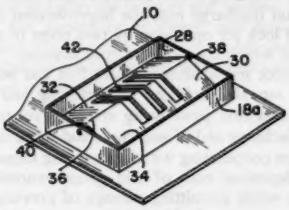
second movement restricting means responsive to a first condition for preventing relative movement between said first and second elements while permitting movement of said elements together relative to said frame.

4,131,190

TAMPERPROOF COIN BOX CLOSURE

Harvey Gitlin, 2232 Bryn Mawr Ave., Philadelphia, Pa. 19131

Filed Apr. 1, 1977, Ser. No. 783,791
Int. Cl.[2] G07F *9/06*
U.S. Cl. 194—1 B **6 Claims**



1. A tamperproof coin box closure to receive coins released by a coin slide comprising

a separator having an opening therein in a position to receive coins from the coin slide; and

a coin receiving member being pivotally secured within the opening and being adapted to permit the unrestricted passage of coins into the interior of the said coin box closure,

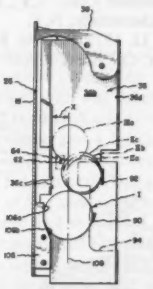
said member being provided with a plurality of coin accepting slots, said slots being of sufficient size to receive coins intended for passsage therethrough as the coins are released from the coin slide.

4,131,191

COIN OPERATED LOCK

Douglas A. Barth, Sinclairville, and Richard J. Chester, Kennedy, both of N.Y., assignors to American Locker Security Systems, Inc., Jamestown, N.Y.

Filed Sep. 19, 1977, Ser. No. 834,456
Int. Cl.[2] G07F *1/04*
U.S. Cl. 194—92 **7 Claims**



1. in a coin operated lock of the type having a coin chute formed with vertically spaced coin inlet and discharge ends and being bounded at least in part by a pair of vertically extending coin edge guiding surfaces and a pair of vertically extending coin side guiding surfaces for constraining coins to move on edge downwardly therethrough, means for limiting passage of coins through said inlet end to coins of a diameter equal to or less than the diameter of a given denomination coin of a given currency intended to operate said lock, a stationary gauging means arranged relatively adjacent said discharge end, a coin selector mechanism arranged relatively adjacent said discharge end and when in a gauging position thereof cooperating with said gauging means for releasably supporting at least certain of the coins deposited in said chute and a coin feeler arranged relatively adjacent said inlet end and removably

insertable into said chute adjacent one of said edge guiding surfaces for sensing the presence of a coin supported in said chute in alignment therewith, characterized in that said lock may be moved from an unlocked into a locked condition only upon the sensing of the presence of a coin by said coin feeler whereafter said coin selector mechanism is moved to a release position for releasing coins retained in said chute for discharge through said discharge end, the improvement for accommodating said lock for operation by two coins of said given denomination, which comprises in combination:

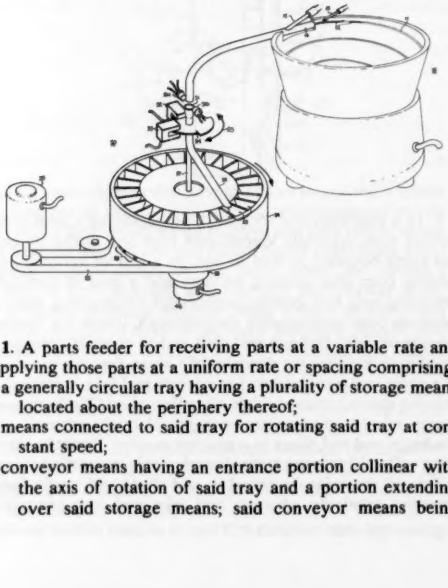
said selector mechanism includes first and second gauging pawls movable between said gauging and release positions, said first pawl being arranged relatively adjacent said discharge end of said chute and when in said gauging position cooperating with said gauging means to support a first deposited coin of said given denomination therewithin while permitting passage of previously deposited improper coins of said given currency having a diameter less than said diameter of said given denomination coin downwardly through said discharge end, said second pawl being disposed relatively above said first pawl and when in said gauging position being spaced from said one of said edge guiding surfaces a distance in excess of said diameter of said given denomination coin, characterized in that placement of said pawls relative to one another, said one of said edge guiding surfaces, said gauging means and said coin feeler provides for alignment with said coin feeler of a second deposited coin of said given denomination while edge-to-edge supported by said first deposited coin and in edge-to-surface engagement with said second pawl and prevents alignment with said coin feeler of subsequently deposited improper coins of said currency while edge-to-edge supported by said first deposited coin and in edge-to-surface engagement with said second pawl or when edge-to-edge supported by one of said subsequently deposited improper coins and in edge-to-surface engagement with said one of said guiding surfaces.

4,131,192

LAMP PARTS FEEDING DEVICE HAVING ROTATING REFERENCE FRAME

Thomas M. Cipolla, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Sep. 12, 1977, Ser. No. 832,395
Int. Cl.[2] B65G *47/00*
U.S. Cl. 198—469 **9 Claims**



1. A parts feeder for receiving parts at a variable rate and supplying those parts at a uniform rate or spacing comprising:

a generally circular tray having a plurality of storage means located about the periphery thereof;

means connected to said tray for rotating said tray at constant speed;

conveyor means having an entrance portion collinear with the axis of rotation of said tray and a portion extending over said storage means; said conveyor means being mounted for rotation about said axis of rotation in synchronism with the rotation of said tray;

stepper means connected to said tray and to said conveyor means for intermittently moving said conveyor means relative to said tray means; and

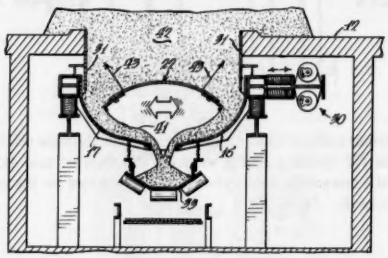
means for controlling the angular position of said conveyor means.

4,131,193

VIBRATORY APPARATUS

Albert Musschoot, Barrington, Ill., assignor to General Kinematics Corporation, Barrington, Ill.

Continuation-in-part of Ser. No. 744,336, Nov. 23, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,508
Int. Cl.[2] B65G *47/19*
U.S. Cl. 198—533 **4 Claims**



1. A vibratory apparatus for delivering particulate material and adapted for use in combination with a base having an aperture therein communicating with a passage beneath the base, said vibratory apparatus comprising a trough having an opening in the bottom thereof with the opening extending from one end of the trough to the other end thereof, said trough having side walls sloping downwardly and inwardly from the side of the trough to said opening, a deflector secured to the trough and extending upwardly therefrom, said deflector having its lower edges spaced from the side walls of the trough and having its center portion located above the opening in the trough, the angle to the horizontal of a line extending from the lower edges of the deflector to the adjacent edge of the opening being less than the static angle of repose of the material, means for mounting said vibratory apparatus in said aperture in the base to support material piled thereover, said mounting means including springs supporting the trough for vibratory movement, a vibration generator secured to said apparatus for vibrating the same in a direction transverse to the direction of extent of the opening, and a conveyor below the opening in the trough to receive material discharged therethrough.

4,131,194

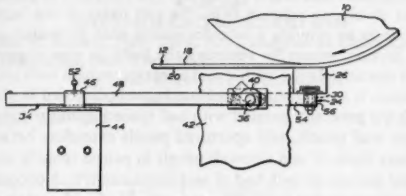
SCRAPER BAR ASSEMBLY FOR ENDLESS CONVEYOR BELTS

Sven E. Andersson, Chagrin Falls, Ohio, assignor to Trelleborg Rubber Company, Inc., Solon, Ohio

Continuation of Ser. No. 751,792, Dec. 17, 1976, abandoned. This application Mar. 23, 1978, Ser. No. 889,186
Int. Cl.[2] B65G *45/00*
U.S. Cl. 198—497 **9 Claims**

1. A scraper assembly for an endless conveyor belt having a belt surface and opposite belt side edges comprising, a plurality of scraper elements having belt engaging ends and mounting ends, said scraper elements each including a mounting plate providing said mounting end and a body of rubber directly attached to said mounting plate and providing said belt engaging end, means including a carrier member extending transverse to said belt side edges and supporting said scraper elements for said belt engaging ends to engage said belt surface, said carrier member having a surface extending in said trans-

verse direction, said mounting plates of said scraper elements having mounting recesses therein, said mounting recesses having parallel opposite sides extending in said transverse direction and engaging longitudinally spaced portions of said carrier member surface, means received within the recesses for coact-



ing with the surfaces forming each recess to removably mount each scraper element on said carrier member against said surface thereof, and said belt engaging ends of said scraper elements having parallel belt engaging scraper edges oblique to said parallel opposite sides of said mounting recess.

4,131,195

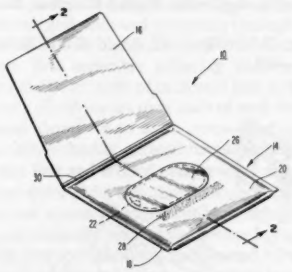
DISPOSABLE, COMPACTABLE MOISTURE IMPERVIOUS PACKAGE FOR PREMOISTENED SHEETS

Robert A. Worrell, Sr., Chester, Pa., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 719,851, Sep. 2, 1976, abandoned. This application Dec. 12, 1977, Ser. No. 859,860

Int. Cl.[2] B65D *81/24*

U.S. Cl. 206—205 **7 Claims**



1. A disposable, pliable and compactable moisture-impervious package for dispensing a stack of premoistened sheets, said package comprising:

a. a pocket portion of pliable and compactable moisture-impervious material, said pocket portion including first and second walls adhered to each other to provide a compartment between them for receiving the stack of premoistened sheets;

b. the stack of premoistened sheets disposed within the compartment with flat surfaces of the sheets generally parallel to the first and second walls of the pocket portion;

c. a dispensing opening in one wall of the pocket portion and overlying the flat surfaces of the premoistened sheets, said dispensing opening having a long dimension extending transversely across said one wall and a short dimension substantially perpendicular to said long dimension, sheets of the stack being folded to provide a dispensing edge disposed generally perpendicular to the long dimension of said opening and intersecting said opening, the dispensing opening including a primary seal for preventing undesirable evaporation of moisture from the sheet;

d. a flap portion of pliable and compactable moisture-impervious material joined to the pocket portion through a hinge line that is generally parallel to the long dimension of the dispensing opening, said flap portion extending beyond the pocket portion and being foldable at the hinge line to overlie the dispensing opening; and

e. securing means for removably securing the flap portion to the pocket portion when the flap portion overlies the dispensing opening to provide a secondary moisture-impervious seal after the primary seal has been broken and between the dispensing of sheets, said securing means maintaining the secured connection between the flap portion and the pocket portion when said package is in a compacted or uncompacted state.

4,131,196

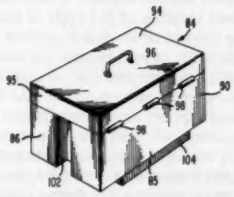
ICE SKATE CARRYING CASE WITH EXTERIOR END WALL SKATE SUPPORT

Frank Csutor, 408 Jefferson Ave., Bristol, Pa. 19007

Division of Ser. No. 567,588, Apr. 14, 1975, Pat. No. 4,021,054. This application Dec. 17, 1976, Ser. No. 751,940

Int. Cl.[2] A65D *85/18*

U.S. Cl. 206—278 **2 Claims**



1. A case for ice skates in the form of a carrying container of rectangular configuration comprising: a pair of end walls; a pair of side walls rigid with and extending between the end walls; a bottom wall rigid with and extending between the end walls and the side walls; and a lid defining a top wall and adapted to be opened to provide access to the container interior, at least one of the end walls being formed with a groove opening exteriorly of the container and extending in length fully from the bottom wall to the lid, said groove being of a width and depth proportioned for receiving and disposing the blade of an ice skate within, and wholly out of contact with the sides and bottom of, the groove, with the boot of the ice skate supported at its sides upon the container end wall as the respective, opposite sides of the groove, said carrying case being interiorly provided with parallel pairs of support rails supported on the bottom wall of the container, the rails of each pair being transversely spaced to receive the blade of the supported skate, the space therebetween being of a width and depth proportioned to receive the blade of an ice skate with the blade wholly out of contact with the rails and the bottom wall, and with the bottom of the boot of the ice skate supported at its sides upon the respective rails that define said space between them, the depth, width, and length of the container interior being relatively proportioned to dispose both boots of a pair of ice skates wholly out of contact with the several walls and the container cover, when the boots are supported on the respective pairs of rails with the blades disposed in the spaces defined between the rails of each pair.

4,131,197
CONTAINER FOR A CASSETTE CONTAINING A RECORDING TAPE, PARTICULARLY FOR A MAGNETIC-TAPE CASSETTE

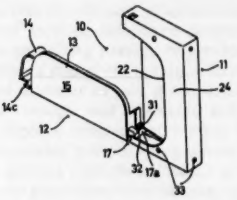
Anton Blankenmeister, Boehl-Iggelheim; Ludwig Peinecke, Frankenthal, and Dieter Koob, Worms, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 16, 1976, Ser. No. 751,115

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1975, 2555734

Int. Cl.² B65D *85/672*

U.S. Cl. 206—387 **7 Claims**



1. A container for the accomodation of a cassette containing a recording tape wound on reels, and in particular a magnetic tape cassette, said container comprising:

a hollow portion having substantially the shape of a rectangular parallelepiped formed by two parallel large-area side walls connected by four narrow walls,

a lid portion consisting of one of said narrow walls and having a support for the cassette which includes projections to prevent rotation of the reels in the cassette, said support being formed of at least a portion of one of said large-area side walls of said hollow portion,

a means located at the bottom end of said lid portion for permitting the pivotal movement of said lid portion together with said support about the adjacent bottom end of said hollow portion whereby the lid portion and support may be swung out from the open container,

a tab formed at the bottom end of said lid portion for engaging the cassette on said support during said pivotal movement, and

a spring member formed at the opposite top end of said lid portion which is arranged to cooperate with one of the adjacent walls of said hollow portion when opening and closing the container from the lid portion side thereof and also being adapted to press the cassette on the support against said tab.

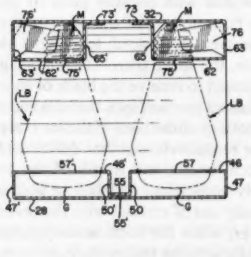
4,131,198
LIGHT BULB PACKAGE

Edward F. Fischer, Dumont, N.J., assignor to Federal Paper Board Co., Inc., Montvale, N.J.

Filed Sep. 21, 1977, Ser. No. 835,152

Int. Cl.² B65D *85/42*

U.S. Cl. 206—419 **7 Claims**



1. A package comprising a pair of electric light bulbs disposed in row alignment and enclosed in an open ended tubular container which container is formed from a single blank of paperboard or similar foldable sheet material divided by hinge score lines into a series of hingedly connected panels including top, bottom and sidewall panels, said sidewall panels extending between outer side edges of said top and bottom wall panels in spaced diverging relation from the top panel to the bottom panel so as to provide a tube formation with truncated cone cross section, means for retaining the bulbs in row alignment and in spaced relation within said container which bulb retaining means is in the form of apertured panels disposed in planes which are generally parallel with and spaced from the top and bottom wall panels, said apertured panels extending between the inner faces of said sidewall panels in paired relation at the top and bottom of each end of said container which cooperate in providing pocket formations at each end of said container in which opposite ends of said bulbs are seated, said apertured panels being held in spaced relation relative to said top and bottom wall panels by narrow, integral hinged side edge panels which are disposed in face contacting relation with portions of said sidewall panels and in edge engagement with adjacent top and bottom wall panels, each of said apertured panels of each pair thereof at each of the container ends extending inwardly from the associated open end of said container to a narrow hinge panel which is secured to the confronting wall panel in hinged relation by a glue tab on the edge of said hinge panel.

4,131,199
RECORD DISK CARTRIDGE

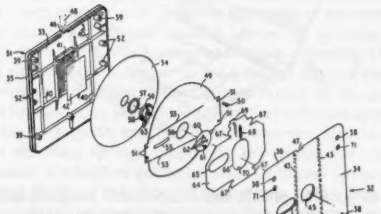
Michael R. Hatchett, Romsey, and Leonard J. Rigbey, Winchester, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 27, 1977, Ser. No. 846,228

Claims priority, application United Kingdom, Jun. 29, 1977, 27124/77

Int. Cl.² B65D *85/02, 85/30;* **G11B** *23/04*

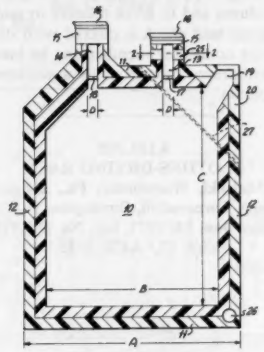
U.S. Cl. 206—444 **16 Claims**



1. A record disk cartridge intended for use installed on a disk drive unit, the cartridge comprising a disk enclosure, a flexible record disk and hub assembly supported within the enclosure for rotation about an axis, said enclosure having first, second and third apertures, said first aperture through the enclosure to permit insertion therethrough of a record/playback head included in such a drive unit in the direction substantially parallel to said axis, said second aperture being through the enclosure through which the disk and hub assembly may be engaged for rotation, a shutter mechanism within the enclosure movable between a first position closing said first aperture and a second position opening said first aperture, biasing means biasing said shutter mechanism towards said first position, said third aperture through the enclosure through which prior to use said shutter mechanism is engaged and moved against the action of said biasing means to said second position, said shutter being in frictional engagement with said hub assembly when in said first

position and completely disengaged from said hub assembly when in said second position.

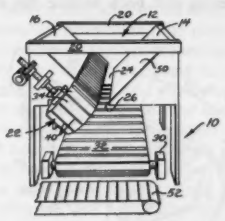
4,131,200
THERMOPLASTIC BLOOD BAG
Arthur P. Rinfret, New York, N.Y., assignor to Union Carbide Corporation, New York, N.Y.
Filed Jul. 6, 1976, Ser. No. 702,421
Int. Cl.[2] B65D *33/16, 81/00, 85/50*
U.S. Cl. 206—484 **14 Claims**



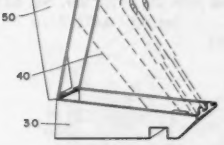
1. A sealed, flexible thermoplastic bag comprising: a fluid storage compartment enclosed by laminate edge seal sections; first and second access passageways each having an outer end joining walls integral with and extending through an edge seal with inner ends in fluid communication with said fluid storage compartment; first separably adhering unfused seal means transverse to the outer ends of each said first and second passageways and pull-tab means over each of such first seal means and associated therewith so as to open same on separation; second separably adhering unfused heat seal means transverse to each of said first and second passageways and intermediate said inner and outer ends, said fluid storage compartment and first and second access passageways each being substantially flat and two dimensional prior to fluid filling but deformable to three dimensional configuration, and formed by said laminate having at least two layers with the innermost layer being heat fusible to itself such that said edge seal sections comprise fused oppositely facing innermost layers with two unfused transversely spaced longitudinal sections each entirely transversely surrounded by the fused innermost layer and each adaptable for outward transversely diverging displacement of said innermost layer by external longitudinal penetration through said outer end so as to form said first and second access passageways.

4,131,201
CONTINUOUS BELT AGGREGATE SEPARATOR
Thomas C. Meisel, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Aug. 24, 1977, Ser. No. 827,206
Int. Cl.[2] B07C *5/12*
U.S. Cl. 209—661 **5 Claims**

1. A separator comprising an upwardly opening bin having converging functionally imperforate sides at its lowermost extremity, the lowermost edges of said sides being spaced to define a first discharge opening, at least one of said sides, adjacent said first opening, including a section unidirectionally movable longitudinally of said first opening, means for unidirectionally moving said section, and a second discharge opening at an end of said bin adjacent said section, said section comprising an endless, jointed cleated crawler type track.



4,131,202
CONSOLE GUN RACK
Lyle K. Hansen, 1110 13th St., Rawlins, Wyo. 82301
Filed Jan. 27, 1976, Ser. No. 652,798
Int. Cl.[2] A47F *7/00*
U.S. Cl. 211—2 **3 Claims**

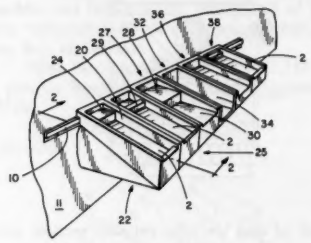


1. A console gun rack, comprising
a console having a lower portion with a front side, the front side of the lower portion of the console having a projection and an interior surface;
a receiver having a tapering base mounted on interior surface of the front side of the console whereby a rifle barrel tip and front sight may be received therein, said receiver having an integral bracket whereby said front sight may hang free;
a cover hingedly affixed to the lower portion of the console, said cover having a front side with groove in said front side for mating with the projection of said lower portion whereby the stock of a rifle may be received in said groove;
an access door mounted in said cover whereby said console may be used to store articles when not holding a rifle; and
holding means for holding said cover open relative to said lower portion whereby a rifle may be held by said console when said console is open.

4,131,203
WALL MOUNTED MODULAR UNITS
John A. Bridges, Nashville, Tenn., assignor to Aladdin Industries, Incorporated, Chicago, Ill.
Filed Jan. 13, 1977, Ser. No. 759,067
Int. Cl.[2] A47F *3/14, 5/08*
U.S. Cl. 211—88 **9 Claims**

1. An article supporting unit for mounting on a vertically extending surface constituted by an upper section having an upper surface for the support of articles and a bottom extending downwardly to the horizontal and a lower section having a top extending downwardly from the horizontal, and said upper and lower sections are joined along their respective

bottoms and tops to form a hollow construction wherein said upper surface is the top thereof and said hollow construction has a back surface extending downwardly from said upper surface, and wherein said back surface has a recess formed



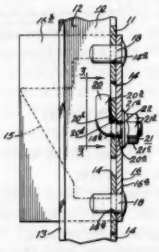
therein and a tongue extending downwardly over a portion of said recess whereby said tongue may engage in an upwardly opening channel in an element on the vertically extending surface and a portion of said element will be disposed in said recess.

4,131,204

POSITIVE-LOCKING RELEASABLE CONNECTOR FOR STORAGE RACK HAVING VERTICALLY ADJUSTABLE LOAD SUPPORTS

Peter H. Jacoby, Perkasie, and Carl G. Seiz, Hatfield, both of Pa., assignors to Seiz Corporation, Perkasie, Pa.

Filed Nov. 20, 1975, Ser. No. 633,676
Int. Cl.[2] A47F 5/10
U.S. Cl. 211—192 **3 Claims**



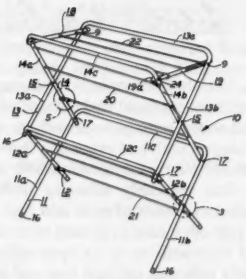
1. In combination with a storage rack column having a front flange with at least one aperture therein and a side flange extending along said front flange in close proximity with said aperture, a clip having a web with a hole adapted to at least partially register with said one aperture when said clip web is engaged flush against the front flange of the column, and means releasably fastening said clip to said column, the improvement wherein said releasable fastening means comprises: an angulated connector member having a threaded shank extending through said hole in said clip and said one aperture in said column and having a lug engaging the rear of the front flange of the column and being dimensioned lengthwise to extend away from said aperture a predetermined distance to engage said side column flange when inserted into said column, a nut threadedly engaged with said shank and engaging the front of said clip when said lug is operatively engaged in the column, said side column flange providing a reaction surface located inside said column in close proximity with said aperture so as to engage said lug and resist rotation thereof when said nut is tightened, said lug defining with said shank less than an orthogonal included angle so that said connector lug engages the inside of the front flange at a location spaced from said one aperture when said connector member is in a relaxed condition and said nut is engaged against the front of said clip, said connector member being fabricated of an elastically deformable material affording elastic flexure of said lug relative to said shank when said connector member is tensioned upon rotation of said nut and pressure engagement thereof with the front of said clip, said nut having a series of peripheral wrench flats and an annular flange having a clip-engaging surface extending radially outward beyond said flats orthogonal to the axis of the shank, said connector member having surface means forming an inwardly-facing recess at the juncture of said shank with said lug to facilitate insertion and withdrawal of said connector member, said clip hole and flange aperture being aligned with one another and said flange aperture being larger than said clip hole, said lug being sized to afford its passage axially through said hole in said clip and said aperture in said column front flange when said clip web is engaged against the front of said column and to pivot relative to said column into a position wherein said shank is coaxial with the hole in said clip whereby the connector member can be inserted into the column and withdrawn therefrom by a workman located in front of the column.

4,131,205

CLOTHES-DRYING RACK

Alexander J. Malecki, Warminster, Pa., assignor to General Home Products Corporation, Burlington, N.J.

Filed Jun. 14, 1977, Ser. No. 806,519
Int. Cl.[2] A47F 5/10
U.S. Cl. 211—200 **12 Claims**



1. A collapsible rack comprising:

a. a first pair of integral generally inverted U-shaped rigid members made of metal, one of which has its legs disposed inwardly of and pivotally joined to the corresponding legs of the other near the midpoints thereof,

b. a second pair of integral generally inverted-U-shaped rigid members made of metal and being substantially identical to said first pair and disposed and pivotally joined to one another in a manner substantially identical to said first pair, said second pair also having at the free ends of its rigid members pivotal connections to said first pair at points on the legs of said first pair in the regions where they join the bights thereof,

c. means associated with said second pair and releasably connectable therebetween for bracing said rack in non-collapsed condition and also for maintaining said rack in said condition, and

d. elongated flexible cord means associated with selected ones of said first and second pairs and said bracing means for enabling articles to be supported therefrom, each of said cord means associated with one of said pairs comprising a continuous length of cord strung parallel to the bight of the inverted U-shaped member of said pair, and wherein one of said members of each of said first and second pairs has its legs separated from one another by a distance which is smaller than the distance separating the legs of the other member of its pair so as to provide a space between corresponding adjacent ones of said legs which is at least about as large as the diameter of said cord

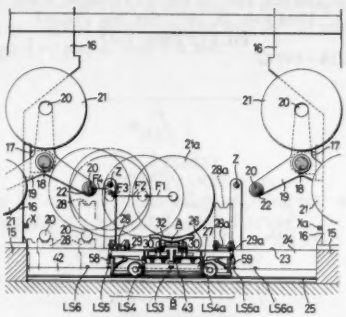
thereby to allow said parts of the lengths of cord to pass in said space between said legs without being appreciably pinched during collapsing or erection of said rack.

4,131,206

AUTOMATIC APPARATUS FOR FURNISHING WEB IN ROTARY PRESS

Tomoshi Kawada, Kawasaki, and Yuichi Okamura, Tokyo, both of Japan, assignors to Kabushiki Kaisha Tokyo Seisakusho and Kabushiki Kaisha Kaneda Kikai Seisakusho, both of, Japan

Filed Jul. 20, 1977, Ser. No. 817,432
Claims priority, application Japan, Mar. 4, 1977, 52-24127
Int. Cl.[2] B66F *9/14*
U.S. Cl. 214—1 BB **20 Claims**



1. An automatic apparatus for furnishing web in a rotary press comprising:

a double truck mechanism for supplying new web, said mechanism consisting of a first truck adapted to move along first rails extending parallel to a reel shaft and support a new web loaded on it and a second truck adapted to move along second rails extending right beneath and at right angles to said reel shaft and said first rails and support said first truck brought and loaded onto it, said second truck being provided with a main lifter for lifting and lowering the loaded first truck;

a pair of web core receptacles provided on said second truck adjacent to the oppsite ends thereof;

a mechanism for mounting and demounting a web core by causing advancement or retreat of center collars provided at mating ends of mating arms of pair tri-fulcated arm members of said reel shaft;

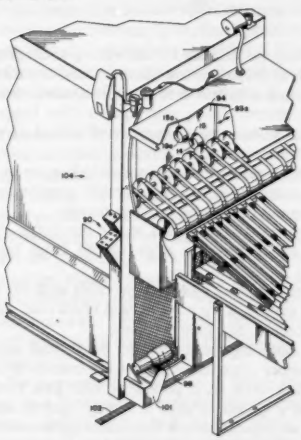
a photoelectric conversion detector means provided such that it is aligned to one end of a web in the state thereof mounted on said reel shaft; a means for positioning the new web in the width direction thereof by restricting the extent to which said first truck is brought onto said second truck in relation to the leading end of the new web when said first truck is brought onto said second truck; a web core collecting means operable by starting said second truck upon completion of the positioning of the new web in the width direction thereof, stopping the second truck when the leading end web core receptacle provided on the second truck reaches a position directly beneath the ends of arms of tri-fulcated arm members previously held in a predetermined waiting position and then causing retreat of center collars on the ends of the arms under the control of a stop confirmation signal to thereby cause the web core to fall onto said web core receptacle; a means for determining the height of the new web by re-starting the second truck under the control of a web core fall confirmation signal, stopping the second truck when the second truck reaches a position right beneath said photoelectric conversion detector means provided in front of and at the same level as said center collars, then raising said main lifter under the control of a stop confirmation signal and stopping the rising of said main lifter upon reaching of a predetermined relation of the hollow cylinder of the core of said new web on said lifter to the level of said detector means; a means for determining the position of said new web in the direction of depth of mounting of the new web by repeatedly causing re-start of said second truck under the control of a signal from said photoelectric conversion type detector means and stopping the second truck when the center of the second truck reaches a position right beneath said center collars; a new web mounting means for causing advancement of said center collars under the control of a stop confirmation signal; and a restoring means for lowering the main lifter by a center collar advancement signal, causing the retreat of the second truck under the control of a lifter descent confirmation signal, stopping the second truck upon restoration of the main lifter to the start position and bringing the first truck out of the second truck under the control of a restoration confirmation signal.

4,131,207

AUTOMATIC SHEET-STACKING AND TRANSPORT MACHINE

Arnold H. Scheinman, 64 Speir Dr., South Orange, N.J. 07079, and Ernst Paisker, 81 JFK Dr., Milltown, N.J. 08850

Filed Nov. 12, 1976, Ser. No. 741,478
Int. Cl.[2] B65G *57/06*
U.S. Cl. 214—6 DK **11 Claims**



1. An automatic sheet-stacking machine, comprising in combination:a stacking support means having a predetermined stack-receiving position for intermittently receiving in series consecutive aligned stacks of sheet-like items as an aligned single-combined stack of increased height; elevator means including a stacking support platform adapted to receive an aligned stack of the sheet-like items at said stack-receiving position, the elevator means being for moving the stacking support platform upwardly and downwardly and for a lowering of the stacking support platform when a sheet-like item is deposited thereon, to a predetermined extent of lowering, and for further additionally lowering the stacking support platform to a lower take-off position as a further-lowering signal becomes activated by the stacking support platform during the stacking support platform lowering toward the lower take-off position; and elevator switching means including a first switch means and a second switch means, a lever means adapted to be contacted by said stacking support platform and operatively connected to both said first and second switch means, the first switch means being first activatable by contact thereof with said stacking support platform when said stacking support

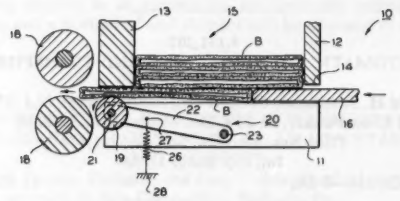
platform moves upwardly, said first activatable thereby setting said elevator means to thereafter move downwardly the stacking support platform as intermittently responsive to receipt of each one of said consecutive aligned stacks, and the second switch means being second activatable by contact thereof with said stacking support platform when said stacking support platform moves downwardly to said lower takeoff postition, said second activatable thereby setting said elevator means to thereafter move upwardly the stacking support platform to said predetermined stack-receiving position.

4,131,208

FEED MECHANISM FOR CARTON BLANKS

Ralph O. Vuilleumier, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 3, 1977, Ser. No. 821,351
Int. Cl.[2] B65G *59/00*
U.S. Cl. 214—8.5 F **7 Claims**



1. In a feeding mechanism for delivering packaging forming material, such as folded carton blanks, without jamming, from a hopper toward a carton erecting mechanism, the combination of:

(a) a hopper containing a plurality of folded carton blanks arranged in a stack;

(b) support means located adjacent said hopper and having a surface extending in a plane generally parallel to the plane of movement of a blank moving means;

(c) a gate member positioned at the discharge end of said hopper and having an edge spaced from said support means;

(d) said blank moving means engageable with the outermost blank of said stack for moving said blank over said support means toward said gate member;

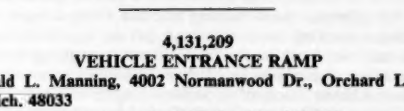
(e) biased metering means located below and adjacent said gate member edge for engaging the outside of said outermost blank only, as it passes by said gate member, and sufficiently biased to urge it snugly against said edge to prevent an adjacent blank from entering between said gate member and said outermost blank.

4,131,209

VEHICLE ENTRANCE RAMP

Donald L. Manning, 4002 Normanwood Dr., Orchard Lake, Mich. 48033

Filed Aug. 18, 1977, Ser. No. 825,752
Int. Cl.[2] B65G *67/02*
U.S. Cl. 214—85 **6 Claims**



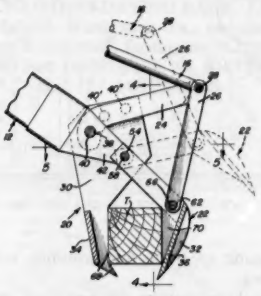
5. In combination with a vehicle having a door opening and a floor within the vehicle opposite said opening, a vehicle frame underlying said floor, a ramp member movable through said opening from a stowed position under said frame to an extended position laterally of said floor, a lead screw journalled in the ramp member for longitudinal movement therewith through said opening, a motor mounted on the opposite end of the ramp member and drivingly connected to axially rotate the lead screw, a nut threadedly engaging the lead screw for effecting longitudinal movement of the screw and ramp member when said motor is energized, and nut supporting means hinged to the vehicle floor and operative to tilt the ramp member upwardly and interconnect its said opposite end and the adjacent edge of the floor when the ramp member is in its extended position.

4,131,210

BACKHOE JAW ATTACHMENT

Clifford G. Everson, 1814 E. 8th St., Olympia, Wash. 98501

Filed Feb. 25, 1977, Ser. No. 772,343
Int. Cl.[2] B66C *1/22*
U.S. Cl. 214—147 G **4 Claims**



1. For use on a backhoe including a dipper stick, a jaw attachment comprising, in combination:

(a) a first jaw affixed to the dipper stick of the backhoe; and

(b) a second jaw pivotally mounted on the dipper stick of the backhoe for movement toward and away from the first jaw, the first jaw including first pin means for mounting the first jaw on the dipper stick of the backhoe and provided with a plurality of pairs of holes arranged for receiving the first pin means, only one of the pairs of holes receiving the first pin means at a time, the plurality of pairs of holes permitting adjustment of the angle of the first jaw relative to the dipper stick, the first jaw further including second pin means for affixing the first jaw on the dipper stick in cooperation with the first pin means, and for pivotally mounting the second jaw on the dipper stick for swinging movement relative to the first jaw.

4,131,211

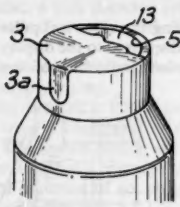
RECEPTACLE MADE OF THERMOPLASTIC MATERIAL

Yves J. Corbic, Chatou, France, assignor to Societe dite: Gatrun Anstalt, Vaduz, Liechtenstein

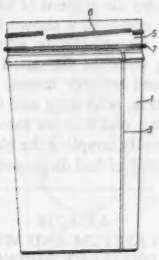
Filed Jul. 12, 1976, Ser. No. 704,730
Int. Cl.[2] B65D *1/06*
U.S. Cl. 215—2 **9 Claims**

1. A receptacle such as a bottle, a beaker or the like, comprising: a side wall made of thermoplastic material; an end wall made of thermoplastic material and integral with said side wall; a separate bottom hermetically closing a filling opening located opposite said end wall; at least one curved or polygonal slot at least partially closed on itself formed through the entire thickness of said end wall and having edges in the form of flanges of substantially rounded section; said slot being made by melting of said thermoplastic material; and a foil or cap covering at least partially said end wall and provided with a layer of adhesive material opposite said end wall, said covering

foil or cap being hermetically fast with a zone of said end wall surrounding said at least one slot and the part of said end wall surrounded by said slot, whereby at least one extraction opening delimited by said slot is provided by removing said covering foil or cap and pulling thereby said part of said end wall surrounded by said at least one slot.

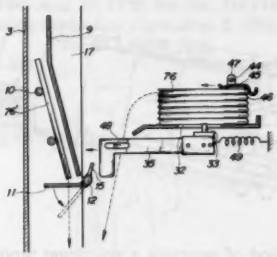


4,131,212
CONTAINERS
Kenneth F. Rumball, Great Bookham, England, assignor to Airfix Industries Limited, London, England
Filed Mar. 28, 1977, Ser. No. 781,990
Int. Cl.² B65D *41/34*
U.S. Cl. 215—252 **1 Claim**



1. A container having an opening surrounded by a rim, screw threads on the exterior of the container adjacent to but below said rim, a closure member having a cover part engageable with the rim of the container and a depending annular skirt having a substantially uniform, straight, vertical outer surface extended between the cover part and the lower edge of said skirt, screw threads on the interior of said skirt engageable with the screw threads on said container, a plurality of radially outwardly extending ratchet teeth on said container below the screw threads thereof, a plurality of radially inwardly extending ratchet teeth on a portion of the skirt of the closure member adjacent the lower edge thereof, said ratchet teeth being arranged to engage and prevent unscrewing of said closure member when the latter has been screwed to a position wherein the cover part is seated on the rim of said container, a plurality of circumferentially spaced perforations around said closure member extending through said skirt between the threads thereof and the portion containing the teeth of said closure member, said perforations defining a tearable line of weakness, and tab means integral with said portion of said closure member skirt carrying said teeth for enabling said portion to be manually torn free of the skirt of the closure member along the line of said perforations after said closure member has been screwed into a closing position on said container, thereby enabling said closure member to be unscrewed in an opening direction.

4,131,213
MAGAZINE VENDING MACHINE
Yoshihiro Tamura, No. 9, Fukuchiin-cho, Nara-shi, Nara-ken, and Takeshi Togashi, 22-5, Aza Kamenoko, Oaza Dogata, Turuoka-shi, Yamagata-ken, both of Japan
Filed Nov. 10, 1976, Ser. No. 740,751
Int. Cl.² G07F *11/20*
U.S. Cl. 221—14 **2 Claims**



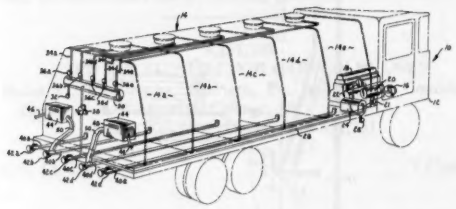
1. A magazine vending machine which comprises:
a housing box having a front opening which is closed by a door provided with show-window means;
a first plurality of shelves provided on said door for displaying respective magazines through said show-window means, each said shelf of said first plurality of shelves having a respective bottom sheet movable from a horizontal level to a downwardly inclined position;
a second plurality of shelves provided within said housing box for stocking thereupon magazines in respective piles, each said shelf of said second plurality of shelves being provided with a respective pusher means which releases magazines one by one upon operation of the vending machine and also provided with respective sensing means which is operable to actuate a corresponding one of said pusher means for bringing a said bottom sheet to the inclined position upon exhaustion of magazines stocked on a corresponding shelf of said second plurality of shelves;
lever means projecting outwardly of said box, said lever means comprising a plurality of levers, each of said levers being operatively connected with a respective one of said pusher means and being manually operable upon the insertion of coins from its retracted position to its withdrawal position,
means for preventing operation of more than one of said levers at a time, said means for preventing including respective limit plates which extend along a direction of movement of said levers and are movable therewith, respective movable locking plates which engage with an end of respective said limit plates, said locking plates being positioned in abutment with adjacent ones of said locking plates in substantial vertical alignment with their lines of abutment coincident with points of contact with respective said limit plates, whereby upon movement of one of said limit plates between adjacent ones of said locking plates by action of one of said levers moves all of said locking plates in a vertical direction placing points of contact of remaining ones of said limit plates with said locking plates away from said lines of abutment; and
means for releasing change operative solely by each said lever, said means for releasing including a respective pusher plate fixed to and movable with each said lever, a respective lug engageble with each said pusher plate when said pusher plate moves forward, each said lug being fixed to an upper portion of a respective pusher which in turn is positioned in a lower portion of a change storing tube, a trough adjustable by a polygonal dial, said dial being rotatably adjustable of its position about an axis, and said trough being biased against said dial by resilient means.

4,131,214

METHOD AND APPARATUS FOR EMPTYING THE CONTENTS OF A TANK CARRIED BY AN ENGINE-POWERED VEHICLE

Joe E. Rogers, Box 456, Waverly, Kans. 66871

Filed Jan. 24, 1977, Ser. No. 761,586
Int. Cl.[2] B67D 5/54
U.S. Cl. 222—1 **6 Claims**



5. A method of emptying a petroleum product contained within a tank, said tank having a selectively operable control valve to permit egress of the petroleum product, said tank further being carried by an engine-powered vehicle when the vehicle is equipped with an air pump, adapted to be operated by the engine of the vehicle, a first surge tank coupled with said air pump for accumulating air under pressure, and air brakes that are operated by the pressurized air accumulated within said first surge tank, said method comprising the steps of:

accumulating within said first surge tank air from said air pump to provide a first source of air under pressure said first source of air under pressure being used to operate said air brakes;

accumulating within a second surge tank air from said air pump whenever the pressure of the air within said first surge tank is above a preset value to thereby provide a second source of air under pressure, said preset value being above the minimum pressure needed to operate said air brakes;

directing air from said second source of air under pressure to a point within said tank above the level of said petroleum product to thereby force said petroleum product from the tank when said control valve is open; and

turning off the engine of the vehicle whenever air from said second source of air under pressure is being directed to said tank.

4,131,215

DISPENSER WITH ADDITIVE OPTION

William B. Hansel, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jul. 5, 1977, Ser. No. 812,948
Int. Cl.[2] B67D 5/06
U.S. Cl. 222—26 **6 Claims**

1. In a system for dispensing fuel having an underground storage tank for the fuel, a first pump for pumping the fuel from the storage tank, a first meter for measuring the quantity of fuel dispensed, electronic means responsive to electronic pulses for computing the cost to the customer of the quantity of fuel dispensed and for displaying the quantity and cost of fuel dispensed, the improvement comprising a system for allowing a customer to select an option of having an additive automatically added to the dispensed fuel and having the price of the additive computed into the cost display and including:

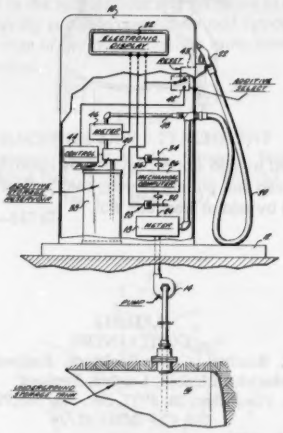
a. a storage reservoir for the additive which is separate from the underground storage tank for the fuel;

b. a second pump coupled to the storage reservoir for pumping slugs of additive from the storage reservoir to the fuel being dispensed;

c. a second meter for metering the quantity of additive dispensed by said second pump and for producing an output indicative thereof;

d. means for producing electrical pulses indicative of the cost and quantity of fuel and the cost of the additive dispensed;

e. means for coupling the electrical pulses indicative of the cost of additive dispensed to the display for inclusion with the electrical pulses indicative of the costs of the fuel



dispensed whereby the amount of fuel dispensed and total cost of fuel and additives is shown by the display; and

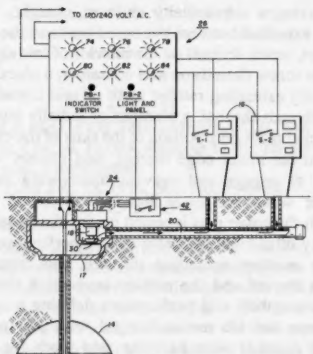
f. selector means for selectively allowing additive to be dispensed along with the dispensed fuel at the option of the customer, said selector means, when in an additive dispensing position, activating said first meter to activate said second pump, said selector means including a switch means for optionally coupling the electrical pulses indicative of the quantity of fuel dispensed to the second pump.

4,131,216

LEAK DETECTION SYSTEM AND METHOD FOR FLUID DELIVERY PIPING

William J. Gerstenmaier, and John A. Todd, both of Salisbury, Md., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 28, 1977, Ser. No. 791,812
Int. Cl.[2] B67D 5/14
U.S. Cl. 222—52 **14 Claims**



1. In a fluid delivery installation including a fluid source, at

least one fluid dispensing outlet, fluid supply piping connecting said fluid source with said dispensing outlet, and a pump capable of being selectively operative for supplying fluid under pressure from said source through said connecting piping to said dispenser outlet, a leak detector system for ascertaining existence of a fluid leak in said installation and comprising in combination:

a) bypass piping connected in parallel with at least a portion of said fluid supply piping;

b) a flow detector situated in said bypass piping and capable of being electrically energized for detecting existence of fluid flow in said bypass piping; and

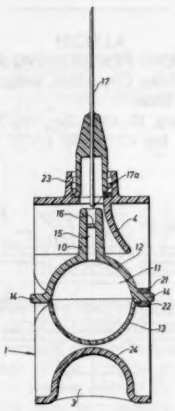
c) control means to serially energize said flow detector in a predetermined sequence of go, no-go steps for ascertaining existence of a pipe leak.

4,131,217

DEVICE FOR EMPTYING A CONTAINER

Owe Sandegren, Skärhamn, Sweden, assignor to Landstingens Inkopscentral, L I C, Svetsarvagen, Sweden

Filed May 19, 1977, Ser. No. 798,291
Int. Cl.² B67B 7/28
U.S. Cl. 222—82 **3 Claims**



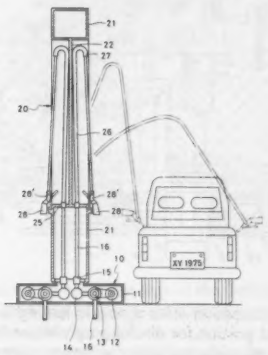
1. In combination, a container and a device for emptying the container, the container comprising two substantially dome-shaped container parts, the container parts having respective concave surfaces which face each other, the container parts communicating with each other to form the container having a peripherally extending joint along which said container parts are sealed together and an outwardly directed flange adjacent the joint, one of the container parts being relatively stiff in comparison with the other and being provided with means defining an outlet opening, the other container part being more flexible to enable it to be pressed into said one container part and substantially into alignment with the inside thereof in order to empty the container; and the emptying device comprising: a holder for the container, the holder having means defining an opening therein and means defining a gap to position and receive most of the flange of the container, the opening defining means and the gap defining means being arranged in relation to each other so that when the flange is inserted in the gap defined by the gap defining means, the outlet opening defined in the container is in substantial alignment with the opening defined in the holder; said holder being provided with an integral emptying member located opposite the said opening defined therein and said emptying member and adjacent connecting portions of the holder being sufficiently flexible to be manually displaceable in the direction of said holder opening for emptying of the container upon displacement of the said emptying member a distance in the direction of the opening defined in the holder sufficient as to press in said other flexible container part until it substantially abuts the inside of said one container part secured to the holder.

4,131,218

APPARATUS FOR DISPENSING GASOLINE HAVING AN INVERTED U-SHAPED CONDUIT

Hiyoshi Tatsuno, Tokyo, Japan, assignor to Tokyo Tatsuno Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,619
Claims priority, application Japan, Sep. 3, 1975, 50/107440
Int. Cl.² B67D 5/06
U.S. Cl. 222—527 **10 Claims**



1. A fuel filling apparatus comprising a fuel reservoir, a stationary conduit having one end leading from said reservoir, a dispensing nozzle, a flexible conduit, a pumping means for transferring the fuel from said reservoir and dispensing the fuel through said flexible conduit to said dispensing nozzle, and elastic means disposed along at least part of said flexible conduit to resiliently support said flexible conduit in a normally substantially inverted U-shaped configuration, an elongated vertical housing in which said inverted U-shaped conduit is disposed, said vertical housing being divided at a fixed elevation into a lower portion and an upper portion, said stationary conduit being disposed in said lower portion, said upper portion of said housing having at least three vertical side walls having a horizontal cross section which is generally U-shaped with one vertical side portion which is open, said U-shaped conduit having

an upwardly extending and substantially vertically disposed flexible conduit portion and a downwardly extending flexible conduit portion joined together by a cross-over flexible conduit portion, said upwardly extending flexible conduit portion having one end thereof connected by first connecting means to said stationary conduit at said fixed elevation, said downwardly extending portion having its downstream end thereof connected to said dispensing nozzle by second connecting means, a receiver means on said housing adjacent said fixed elevation for holding said nozzle when the latter is not dispensing fuel, said elastic means being constructed and arranged on said flexible conduit such that upon manual displacement of said dispensing nozzle in a generally lateral direction, said flexible conduit will be resiliently flexed and displaced as the flexible conduit is moved out of said housing through said open vertical side portion such that said cross-over flexible conduit portion is lowered to thereby increase the area for fueling vehicles with said dispensing nozzle, said flexible conduit in its unflexed condition having its inverted U-shaped configuration extending from said first connecting means to said second connecting means such that the flexible conduit in its inverted U-shaped unflexed condition supports a substantial portion of the weight of said nozzle in a position adjacent to said receiver means and

said flexible conduit in its inverted U-shaped unflexed condition is accommodated in said housing.

4,131,219

POURING OF MOLTEN METALS

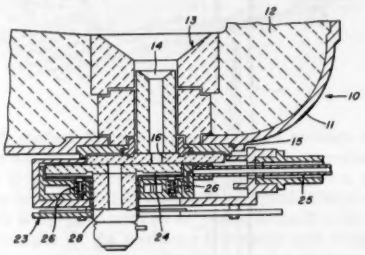
Robert D. Hind, Rotherham; Anthony Thrower, and Joseph W. Cudby, both of Sheffield, all of England, assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Jul. 25, 1977, Ser. No. 818,792

Claims priority, application United Kingdom, Aug. 3, 1976, 32195/76

Int. Cl.² F16K *51/00*

U.S. Cl. 222—603 **8 Claims**



1. In combination with a nozzle having a frusto-conically tapered end portion for discharging a stream of molten metal, means for ejecting gas under pressure cocurrently with the molten metal stream in surrounding relation thereto over at least part of the emergent metal stream, said means comprising:

(a) a tubular member concentrically spaced from said nozzle and cooperating therewith to define an annular gas reservoir;

(b) gas inlet means communicating with said gas reservoir;

(c) said tubular member including a frusto-conical lip portion cooperating with the tapered end portion of said nozzle to define a convergent, open-ended annulus therebetween;

(d) a plurality of circumferentially spaced abutments disposed in said annulus to maintain the spacing between said tubular member and said nozzle; and

(e) said lip portion including a shallow, arcuate hollow downstream of said abutments operative to deflect gas passing through said annulus against the tapered end portion of said nozzle.

4,131,220

POUR TUBE MANIPULATOR FOR SLIDING GATE VALVE

Charles H. Bode, Jr., Bethel Park; Anthony S. Saggio, Pittsburgh; George J. Wagner, Jr., McDonald, and Richard L. Wessel, Plum Borough, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 763,187, Jan. 27, 1977, abandoned. This application Feb. 3, 1978, Ser. No. 874,724

Int. Cl.² B22D *41/08*

U.S. Cl. 222—607 **15 Claims**

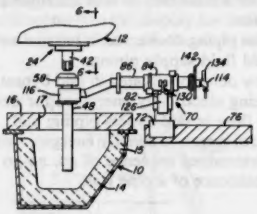
15. Means for mounting a pour tube in operative relation to the pour opening in a bottom-pour teeming vessel comprising:

a) a stationary base disposed remote from said teeming vessel;

b) mast means upstanding from said base having a longitudinal axis in laterally spaced relation to said pour opening, and said mast means being extensible and retractable along said longitudinal axis and rotatable thereabout;

c) open ended journal means attached to said mast means adjacent the upper end thereof, the axis of said journal means being substantially normal to the axis of said mast means;

d) an elongated arm coaxially disposed in said journal means for rotation about the longitudinal axis thereof and for relative axial movement with respect thereto, said arm having means adjacent one end for releasably mounting a pour tube with its axis substantially parallel to the axis of said pour opening;



e) means for imparting compound movement to said pour tube including means for rotating said arm within said journal means and for moving said arm axially with respect thereto; and

f) means for selectively adjusting the axial position of the pour tube mounting means with respect to said pour opening.

4,131,221

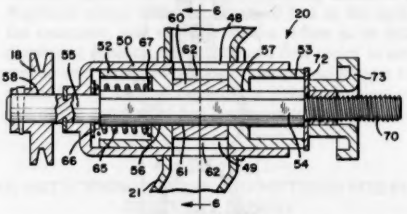
PLANTING AND FERTILIZING APPARATUS

Robert R. Yeager, Union City, Ohio, assignor to Lambert Corporation, Dayton, Ohio

Filed Aug. 13, 1976, Ser. No. 714,282

Int. Cl.² G01F *11/10*

U.S. Cl. 222—624 **1 Claim**



1. For use with a gardening apparatus having a frame, a ground engaging and ground driven wheel attached to the frame, a storage hopper supported on the frame, and a fertilizer feed chute connected to the bottom of the hopper for distributing fertilizer therefrom; a fertilizer feeding mechanism located in the chute, comprising:

(a). a tube supported in the chute,

(b). means defining entry and exit openings into and out of said tube in and intercepting the flow path of the fertilizer through the interior of the fertilizer feed chute,

(c). a drive shaft for the fertilizer feeding mechanism supported for rotation in the tube,

(d). means connecting the wheel of the gardening apparatus to said drive shaft for rotating said drive shaft as the wheel rotates,

(e). a feed gear drivably mounted on said drive shaft for rotation therewith as said drive shaft is rotated, said feed gear being axially displaceable along said drive shaft and having gear teeth around its periphery,

(f). means biasing said feed gear for displacement axially along said drive shaft away from one end thereof,

(g). said shaft being threaded on the other end thereof,

(h). screw means threaded onto said threaded drive shaft end in opposition to said biasing means for shifting said feed gear axially along said drive shaft in response to rotational adjustment of said screw means on the threaded end of said drive shaft to position said feed gear with respect to

said entry and exit openings for selectively exposing portions of said gear teeth thereto in response to the axial position of said feed gear teeth with respect to said entry and exit openings, and

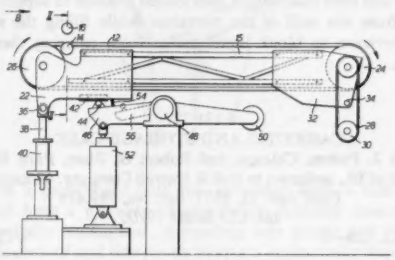
(i). a first feed gear extension on said drive shaft between said biasing means and said feed gear, and a second feed gear extension on said drive shaft on the opposite side of said feed gear between said feed gear and said screw means, said feed gear extensions being separate pieces from said feed gear to provide for feeding the fertilizer with such a gear while closing the portions of said entry and exit openings not exposed to said gear as said gear is shifted axially along said drive shaft in said tube, said mechanism providing for quickly, easily, accurately, and rapidly adjusting and regulating the amount of fertilizer fed by said feed gear as it is rotated by said drive shaft.

4,131,222

SNAPPING OF SHEETS OF GLASS

Joseph B. Hodgkinson, Billinge, Near Wigan, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Sep. 20, 1977, Ser. No. 834,924
Int. Cl.[2] C03B *33/02*
U.S. Cl. 225—3 **12 Claims**



1. A method of snapping a sheet of glass having at least one score line extending along the sheet and separating the snapped portions by a predetermined amount, comprising advancing at least the leading edge of the sheet over conveying means, exerting on at least the leading edge of the sheet a plurality of forces diverging away from one another in the direction of advance, raising the trailing edge of the sheet above the leading edge and imposing on the sheet at its trailing edge a bending moment about its direction of advance which is sufficient to snap the sheet along any score line parallel to the direction of advance but is insufficient to break any unscored area of the sheet, and continuing to advance the snapped portions of the sheet so formed over the conveying means while maintaining the diverging forces, thereby effecting a lateral separation between the snapped portions of the sheet.

4,131,223

APPARATUS FOR GAPPING A SLIDE FASTENER

William D. Aureli, Watertown, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

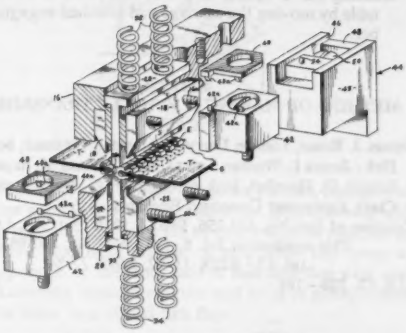
Filed Dec. 5, 1977, Ser. No. 857,777
Int. Cl.[2] B26D *1/06, 9/00;* **B26F** *3/00*
U.S. Cl. 225—94 **5 Claims**

1. Apparatus for forming a desired gap in the lines of fastener elements in a slide fastener chain, the chain comprising a pair of stringers each having longitudinally aligned U-shaped plastic fastener elements held in longitudinally spaced relation by a pair of cords molded respectively into the ends of the legs of the U-shaped elements, the openings of the elements receiving respectively the edges of the slider tape, stitches securing the lines to the respective tapes, the elements of the two stringers being interengaged, the apparatus comprising

(a) means to support the slide fastener in the area of the desired gap and hold it in proper lateral position with respect to the apparatus including a pair of aligned opposed spring-biased elongate guides disposed longitudinally of the lines and engaging the lines from opposite sides at approximately the zone of interengagement of the lines;

(b) a pair of vertically closing jaws adjacent the guides and carrying

(1) a pair of sets of knives with one set on opposite sides of the guides respectively, the sets being cooperatively positioned and slightly laterally offset and adapted, as



the jaws close, to break the legs of the fasteners in area of the desired gap of the respective lines at positions adjacent the stitches; and

(2) four sets of cooperating cutters, each cutter set being disposed transversely of the lines of fasteners and adapted in the closing of the jaws to sever the cords at positions at the end of the desired gap;

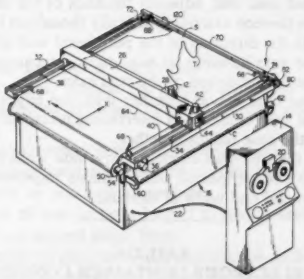
whereby the portion of the lines of fastener elements in the desired gap after the reopening of the jaws may be removed to leave in the gap only the tapes and the residual stitches.

4,131,224

DETACHABLE INDEXING DEVICE AND METHOD

Heinz J. Gerber, West Hartford, and David J. Logan, Glastonbury, both of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Filed Jul. 22, 1977, Ser. No. 818,013
Int. Cl.[2] B65H *17/36*
U.S. Cl. 226—8 **13 Claims**



7. A method of precisely indexing a strip of sheet material over the work surface of a table in one coordinate direction by means of a carriage which carries an instrument and traverses the work surface in said direction from one end to an opposite end with accuracy sufficient to position the instrument for operation at different points of the material on the work surface comprising:

locating a strip-engaging member in a parking position at one end of the work surface while the carriage is position-

ing the instrument in an operation over the sheet material on the work surface;

after the operation over the sheet material on the work surface, positioning the carriage at said one end of the work surface where the engaging member is in the parking position;

attaching the engaging member to the carriage for traversing movement over the work surface with the carriage;

coupling the strip of sheet material to the carriage by means of the strip-engaging member; and

indexing the coupling strip over the work surface of the table by moving the carriage and attached engaging member.

4,131,225

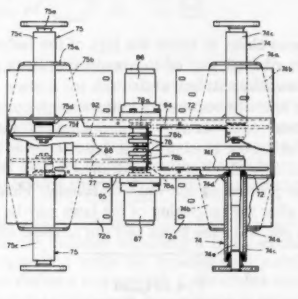
METHOD OF MAKING A VEHICLE TRANSMISSION CASE

James J. Bauer, Lisbon; Larry E. Albright, Gwinner, both of N. Dak.; James L. Werner, Lamar, Mo.; Thomas M. Sagaser, and Lonnie D. Hoechst, both of Gwinner, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Division of Ser. No. 654,256, Feb. 2, 1976, Pat. No. 4,055,262. This application Jul. 8, 1977, Ser. No. 807,983

Int. Cl.² B23K *31/02;* B60K *17/04*

U.S. Cl. 228—161 **3 Claims**



1. A method of manufacturing a transmission case for a vehicle, comprising,

forming a pair of matched halves each having a side wall element, and a peripheral wall element extending laterally from the side wall element and terminating in a laterally facing peripheral edge,

mounting axle housings for receiving stub axles therein, to each said case half, adjacent the ends of the case half, in position thereon extending laterally therefrom in direction opposite the direction of the peripheral wall element,

boring the axle housings as mounted on separate halves of the case for reception of the stub axles,

placing the case halves together with the edges of the peripheral wall elements in interfacing juxtaposition, and

securing the case halves together,

whereby the side wall elements from side walls of the case, and the two peripheral wall elements together form top, bottom, and end walls of the case.

4,131,226

SULFUR ELECTRODE CONTAINER CONSTRUCTION AND METHOD OF MANUFACTURE

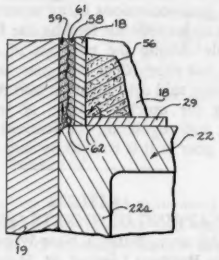
Manfred W. Breiter, Schenectady; Debajyoti Chatterji, Latham; Randall N. King, Johnstown, and Dong-Sil Park, Schenectady, all of N.Y., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 28, 1977, Ser. No. 837,381

Int. Cl.² B65D *25/14;* B23K *31/00;* H01M *2/00, 2/08*

U.S. Cl. 228—198 **1 Claim**

1. The method of making a sulfur electrode container construction of a type for containing sulfur in liquid form comprising the steps of forming a sheet of anti-corrosive foil material into a cylindrical body, disposing said body into a cylindrical container of a material which is significantly subject to corrosion by liquid sulfur, disposing said cylindrical body into the container in a manner disposing the outer sidewall of the body in closely spaced relation to the sidewall of the container to form a protective liner within the container while permitting



sulfur vapor to pass into the spacing defined between the inner sidewall surface of the container and the outer wall surface of the cylindrical liner to form a coating of sulfides of the container and liner materials in interlocked relation to support the liner from the wall of the container while filling the space therebetween to block liquid sulfur from entering therebetween.

4,131,227

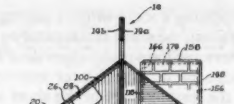
CARRYING AND STORAGE CASE

Donna J. Patton, Chicago, and Robert G. Riess, Park Ridge, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Apr. 21, 1977, Ser. No. 789,475

Int. Cl.² B65D *79/00*

U.S. Cl. 229—8 **4 Claims**



1. A carrying case shaped to resemble a house having four walls, a roof and a floor, comprising:

a first sheet of rigid stock shaped and folded to form the four walls, floor and roof of the house, said roof having an aperture and a slot defined therein;

a second sheet of rigid stock interposed between two of said walls to form a dividing wall, said second sheet including a handle portion extending through the slot in said roof and forming a carrying handle for said case, said second sheet being folded onto itself to form two panels, said dividing wall being formed from said two panels to form a double thickness wall, one of said panels being folded and disposed adjacent to said floor on one side of said dividing wall and adjacent to the one of said walls opposite said one side of said dividing wall, the other one of said panels being folded and disposed adjacent to said floor on the other side of said dividing wall and adjacent to said wall opposite said other side of said dividing wall,

said first sheet being folded over the portions of said first and second panels adjacent to said respective walls opposite said dividing wall, thereby retaining said portions of said first and second panels adjacent said walls opposite said dividing wall;

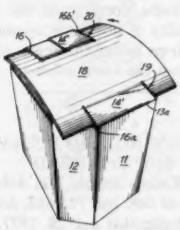
a third sheet of rigid stock shaped and folded to form a hollow rectangular cylinder having at least one movable end cover, said rectangular cylinder extending from within said case through the aperture in said roof to form a chimney and to define a separate, self-contained storage compartment within said defined case.

4,131,228

BOTTOM FOR BULK BINS

Edward J. Barry, Creve Coeur, Mo., assignor to International Paper Company, New York, N.Y.

Filed Aug. 22, 1977, Ser. No. 826,466
Int. Cl.[2] B65D *13/00*
U.S. Cl. 229—23 R **11 Claims**



1. In a paperboard bulk bin, provided with: a side wall formed from a plurality of alternating, foldably connected, substantially rectangular, upstanding side panels and corner panels; each of said side panels having a horizontally disposed, substantially rectangular flap, foldably connected to the bottom edge thereof; each of said corner panels having a horizontally disposed, four-sided, tapered flap, foldably connected to the bottom edge thereof and positioned atop adjacent rectangular flaps; and each of said tapered flaps and rectangular flaps being foldably connected to a triangular gusset panel, horizontally disposed between them; the improved bottom pad which comprises:

an unscored, unfolded, generally rectangular, substantially planar, substantially rigid member, having two pairs of parallel slots, extending from opposite side edges thereof; said pairs of slots being substantially aligned; and

the foldable connections between each of two rectangular flaps, on opposite sides of the bin, and the pairs of triangular gusset panels, about each of said two rectangular flaps, being disposed within said slots of said bottom pad, so that the portions of said bottom pad, between each pair of said parallel slots, are between one of said two rectangular flaps and its foldably connected pair of triangular gusset panels.

4,131,229

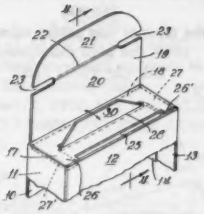
LOCK TOP FOR FOLDING CARTON

Guy Nastasi, 1251 Ash Ave., Bensenville, Ill. 60106

Filed Oct. 25, 1977, Ser. No. 844,925
Int. Cl.[2] B65D *5/10*
U.S. Cl. 229—39 R **3 Claims**

1. In a folding box of cardboard or the like having two pair of opposed sides and a closure at one end which closure comprises a pair of flaps each extending from one side respectively of one of said pair of sides toward the other side of said one pair and a third flap extending from one side of the other pair toward the other side of said other pair, said third flap being outwardly of the pair of flaps, said third flap having latching means engaging at least one of said pair of flaps, said flaps having inner and outer faces, the improvement comprising:

a first of said pair of flaps having a longitudinal slot therein which slot is approximately centrally located in said one flap; and



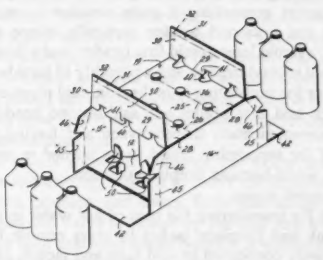
the other of said pair of flaps comprising a back portion and a front portion with a line of juncture therebetween, said front portion including a tab bent upwardly at said line of juncture, said back portion of said other flap lying in juxtaposition to the inner face of said first flap with said tab extending through said slot and lying in juxtaposition to the outer face of said first flap.

4,131,230

TWELVE BOTTLE CARTON

Allen W. Koehlinger, and Norman J. Fox, both of Cincinnati, Ohio, assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Jan. 30, 1978, Ser. No. 873,276
Int. Cl.[2] B65D *5/02*
U.S. Cl. 229—40 **4 Claims**



1. A carton for bottles comprising,

a bottom panel, vertical end panels hinged to the bottom panel, a top panel hinged to the end panels, said top panel having

a) a center section hinged to the end panels,

b) a pair of intermediate sections hinged to said center section on said first hinge lines,

c) a pair of side sections hinged to said intermediate sections on second hinge lines,

d) three bottle neck receiving openings on each hinge line,

and side flaps hinged to said bottom panel and adapted to be secured to said side sections,

whereby, with said intermediate and side sections swung upwardly, a first row of bottles may be introduced into each side of said carton until their necks engage said holes on the first hinge line, said intermediate side sections may be swung to a horizontal attitude to capture said first row of bottles, a second row of bottles may be inserted into each side of said carton until their necks engage said holes on said second hinge line and thereafter said side sections may be swung down and glued to said side flaps.

4,131,231

FIREPLACE HEATING SYSTEM

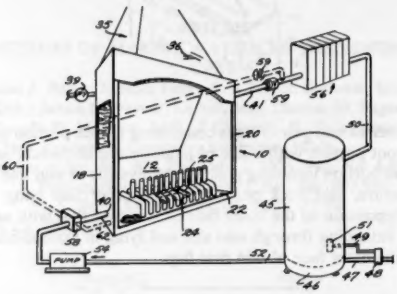
Clarence W. Cleer, Jr., Kane, Pa., assignor to Ridgway Steel Fabricators, Inc., Ridgway, Pa.

Division of Ser. No. 687,631, May 18, 1976, Pat. No. 4,025,043, which is a continuation-in-part of Ser. No. 495,107, Aug. 5, 1974, Pat. No. 3,958,755. This application Feb. 1, 1977, Ser. No. 764,904

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.² F24D *3/00*

U.S. Cl. 237—8 R **8 Claims**



1. A heating system for heating a confined area said system comprising:

(a) a hot water storage tank,

(b) means for heating water in said water storage tank,

(c) a fireplace jacket remote from said means for heating water in said storage tank comprising means for circulating water directly around an open-hearth wood-burning fireplace adapted to have an open fire therein, said fireplace jacket comprising a grate member having a first header and a second header vertically above said first header, a liquid inlet to said first header, and a liquid outlet from said second header, and a plurality of liquid-conducting pipes for supporting logs thereon, said pipes extending between said first header and said second header and in flow communication therebetween and having portions thereof for supporting wood to be burned in said open-hearth wood-burning fireplace thereon,

(d) a powered pump,

(e) means for transferring the heat of hot water in said storage tank and fireplace jacket to areas remote from but operatively connected to said tank and jacket, and

(d) means for providing operative communication between said pump, fireplace jacket, hot water storage tank, and heat transferring means so that water heated by an open fire in said fireplace will be circulated to and from said storage tank by said pump and will be in operative communication with said transfer means whether or not said means for heating water in said storage tank is operating.

4,131,232

AUTOMATIC SHOWER DISPENSER

Angeline D. Pollinzi, 6425 Westlake, Dallas, Tex. 75214

Filed May 23, 1977, Ser. No. 799,226

Int. Cl.² B05B *7/24, 9/00*

U.S. Cl. 239—314 **8 Claims**

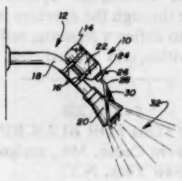
1. An automatic dispensing device attachable to a conventional shower head for introducing a controlled flow of liquid additive to the spray of water flowing from the openings in the front of the shower head, comprising:

a plastic container suitable for holding a quantity of the liquid additive, said container including an opening for receiving and discharging the liquid additive,

means for attaching said container to the shower head such that the liquid additive may flow from said container opening under the force of gravity,

a valve attachable to said opening of said container for controlling the flow of liquid additive, and

a first tubular portion communicating with said valve, a second tubular portion communicating with said first portion and extendig to two diverging tubular members, and a third tubular portion communicating with the ends of said two diverging members, said third portion being located subjacent the openings in the shower head and including a plurality of discharge openings, such that the liquid additive drips under the force of gravity into the flow of water from the shower head.



4,131,233

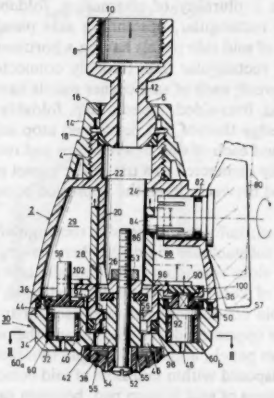
SELECTIVELY-CONTROLLED PULSATING WATER SHOWER HEAD

Shulamith Koenig, 3 Kadesh Barnea, Tel Aviv, Israel

Continuation-in-part of Ser. No. 713,615, Aug. 11, 1976, Pat. No. 4,089,471. This application Jul. 29, 1977, Ser. No. 820,328

Int. Cl.² B05B *3/06*

U.S. Cl. 239—381 **10 Claims**



1. A pulsating water shower head, comprising: a housing having an inlet connectable at its upper end to a supply of water; a spray block at the lower end of the housing; said spray block including a bottom wall, a top wall, an annular side wall joining the bottom and top walls, and an annular partition wall coaxial with said annular side wall and partitioning the space between same and the top and bottom walls into a central chamber and an annular chamber therearound; said spray block bottom wall being formed with a first group of water outlet openings leading from said central chamber, and a second group of water outlet openings leading from said annular chamber; said spray block top wall being formed with a first passageway for introducing water into said central chamber, and a second passageway for introducing water into said annular chamber; a plurality of freely movable members disposed within said annular chamber and drivable therearound by the water inletted into the housing, for ouletting the water through

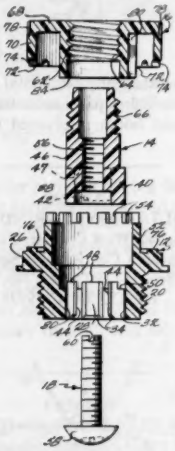
said second group of openings in the form of a pulsating spray, while the water outletted through the first group of openings is in the form of a continuous spray; and a manually-controlled diverter for selectively opening one of said passageways in the spray block top wall and closing the other to selectively enable either the continuous spray or the pulsating spray to be outletted from the lower head.

4,131,234

ADJUSTABLE BUBBLER SPRINKLER HEAD

James R. Pescetto, Springfield, Ill., assignor to L. R. Nelson Corporation, Peoria, Ill.

Filed Aug. 12, 1977, Ser. No. 824,113
Int. Cl.² B05B *1/14*
U.S. Cl. 239—457 **14 Claims**



1. A sprinkler head comprising:

an annular body having means on a lower portion thereof for fixedly securing the same to a supply member having a source of water under pressure communicated therewith;

said body having a tubular member therein defining an interiorly threaded opening extending axially in relation to said annular body;

an adjusting screw threadably mounted in said interiorly threaded opening, said screw having an enlarged head on the lower end thereof disposed in communicating relation to the water under pressure communicated with said body;

means within said body defining inlet passage means disposed in flow restricted relation with respect to said adjusting screw head whereby the axial position of said adjusting screw head determines the amount of flow of water through said inlet passage means;

said body having an annular wall disposed outwardly of said inlet passage means and extending upwardly therefrom for directing the flow of water passing through said inlet passage means upwardly along the interior thereof;

a spray adjusting member mounted on the upper end portion of said tubular member for axial adjustment with respect thereto;

said spray adjusting member having an upper end wall extending radially outwardly in a position above said annular wall so as to receive the water flowing upwardly therealong and direct the same outwardly;

said spray adjusting member having a peripheral wall extending downwardly from the periphery of said upper end wall in spaced relation to said annular wall so as to cause the flow of water directed outwardly by said upper end wall to pass downwardly between the interior of said peripheral wall and the exterior of said annular wall; and

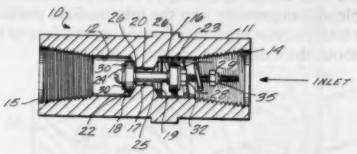
cooperating downwardly facing surface means on the lower portion of said peripheral wall and upwardly facing surface means on said body for confining the water flowing downwardly between said peripheral wall and said annular wall into an outwardly directed spray pattern which can be varied depending upon the axial position of adjustment of said spray adjusting member with respect to said body.

4,131,235

DUAL-FUNCTION VALVE

Calvin A. Lieding, Glendora, Calif., assignor to Irrigation Specialties Company, San Gabriel, Calif.

Filed Nov. 1, 1976, Ser. No. 737,335
Int. Cl.² B05B *1/30*; F16K *17/04*
U.S. Cl. 239—533.15 **8 Claims**



1. A normally closed dual-function valve for insertion in an irrigation water line upstream of a sprinkler head, the valve being arranged to block water flow through the line when the flow rate is above or below a normal operating range of flow rates to provide excess-flow and anti-drain protection, the valve comprising:

a valve body having a passage therethrough with inlet and outlet ends adapted for connection to upstream and downstream water conduits respectively, the body further including first and second valve seats in the passage;

closure means disposed within the passage to be movable between first and second positions and including first and second closure surfaces configured to seal against the first and second seats respectively, the first closure surface being sealed against the first seat with the second closure surface being separated from the second seat in the first closure-means position, and the second closure surface being sealed against the second seat with the first closure surface separated from the first seat in the second closure-means position; and

resilient means disposed between the body and closure means and exerting a force to move the closure means to the first position and away from the second position whereby the valve is closed by the first seat and closure surface until upstream water pressure is sufficiently higher than downstream water pressure to move the closure means against the force exerted by the resilient means to a position intermediate the first and second positions for normal water flow through the valve, and whereby excessive water flow through the valve will further overcome the force exerted by the resilient means to drive the closure means to the second position so the valve is closed by the second seat and closure surface.

4,131,236

HIGH VELOCITY LIQUID JET CUTTING NOZZLE

David H. Saunders, Cranfield, England, assignor to The British Hydromechanics Research Association, Cranfield, England

Filed Dec. 17, 1976, Ser. No. 751,718
Claims priority, application United Kingdom, Dec. 24, 1975, 52891/75; Jun. 15, 1976, 24751/76
Int. Cl.² B05B *1/00*
U.S. Cl. 239—589 **14 Claims**

1. A high velocity liquid jet nozzle, for use in a liquid jet cutting apparatus, comprising:

a high pressure liquid pipe having an outlet for the supply of high pressure liquid;

a cup-shaped holder connected to the high pressure liquid pipe;

a mounting seated in the holder and attached to the outlet of the high pressure liquid pipe; and

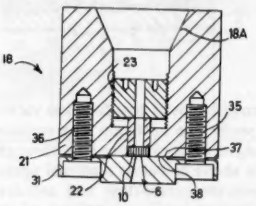
a nozzle member supported by the mounting in communicative connection with the outlet of the high pressure liquid pipe, for use in the formation of a high velocity jet of liquid from the high pressure liquid pipe, in which:

a piece of artificial sapphire is formed with a circular, internally polished aperture;

the aperture has a convergent inlet portion, a uniform diameter intermediate portion extending from the inlet portion and having a length of one-quarter to five times said diameter, and a divergently bevelled outlet portion;

the inlet portion is formed as a surface of revolution about the axis of the aperture, of a smooth curved arc which blends tangentially into the intermediate portion;

the intermediate portion is formed as a surface of revolution, about the axis of the aperture; and



the outlet portion is formed as a surface of revolution, about the axis of the aperture, making a sharp junction with the intermediate portion, and the angle of divergence of said lastmentioned surface is sufficiently great to ensure that a jet of high pressure liquid issuing from the intermediate portion of the aperture leaves the surface of the outlet portion without significant disturbance to the jet;

wherein the mounting supporting the nozzle member is a reusable mounting which is removably supported within said cupshaped housing and comprises at least two separable body members connected together, fastening means for releasably securing the body members together, an aperture extending through the body members and formed with an internal step on which the nozzle member is seated so that the nozzle aperture is in co-axial alignment with the mounting aperture, said apertures in turn being in co-axial alignment with the outlet of said pipe, and a separable sleeve which is mounted on a said body member and is co-axially disposed within the mounting aperture for pressing the nozzle member onto the step.

4,131,237

SPREADING IMPLEMENTS

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely NV, Maasland, Netherlands

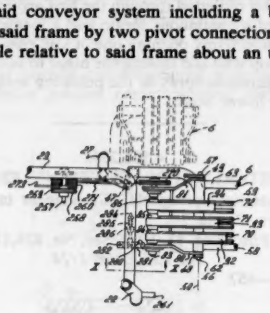
Filed Dec. 15, 1975, Ser. No. 640,730

Claims priority, application Netherlands, Dec. 19, 1974, 7416559

Int. Cl.[2] A01C *17/00*

U.S. Cl. 239—664 **20 Claims**

1. A spreading implement comprising a frame supporting a hopper for material to be spread and an elongated conveyor system extending laterally from each side of said hopper with respect to the direction of normal travel, said system comprising side-by-side elongated conveyors that extend laterally from each side of said hopper, outlet means adjacent the bottom of said hopper and said oulet means communicating material to said conveyors, driving means connected to move said conveyors and each conveyor comprising a belt having an outer end with a rotatable spreading member being positioned adjacent said end, said spreading member being engaged by said driving means and synchronized with the movement speed of said conveyors, said conveyor system including a boom that is connected to said frame by two pivot connections, said boom being pivotable relative to said frame about an upwardly ex-



tending axis and a substantially horizontal axis, and said driving means having transmission parts mounted on said boom that disengage when said boom is pivoted about the upwardly extending axis.

4,131,238

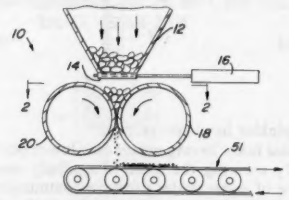
ULTRASONIC GRINDER

William B. Tarpley, Jr., West Chester, Pa., assignor to Energy and Minerals Research Co., Kennett Square, Pa.

Filed Sep. 15, 1977, Ser. No. 833,632

Int. Cl.[2] B02C *19/18*

U.S. Cl. 241—30 **14 Claims**



1. Apparatus for comminuting materials comprising first and second elements cooperating to mechanically comminute materials at a nip therebetween, at least one of said elements is resonant, a source of vibratory energy connected to said resonant element, said source being of sufficient power levels so that vibratory action may be transmitted by said resonant element to the material being comminuted to cause cyclic fatigue stresses in the material while the material is being mechanically comminuted, and motor means separate from said source of vibratory energy, said motor means being connected to said resonant element for causing the mechanical comminution of the material being treated.

4,131,239

FLUID ENERGY MILL FOR LARGE PARTICULATE MATERIALS

Nicholas N. Stephanoff, Haverford, Pa., assignor to Energy Processing and Equipment Co., Bala Cynwyd, Pa.

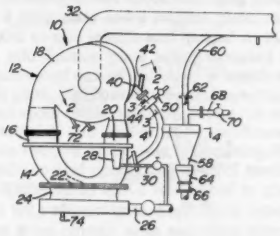
Filed Jun. 13, 1977, Ser. No. 805,878

Int. Cl.[2] B02C *19/06*

U.S. Cl. 241—39 **5 Claims**

1. A grinding mill comprising a generally annular housing including an inlet grinding chamber at one portion of said housing, a classification chamber at the opposite portion of said housing, an upstack connecting one end of said inlet chamber to one end of said classification chamber, an exhaust port in communication with the inner periphery of said classification chamber, a downstack in opposed relation to said upstack and connecting the opposite end of said inlet chamber to the oppo-

site end of said classification chamber, a feed inlet at the junction of said downstack and inlet chamber, said feed inlet leading into said inlet chamber, a plurality if tangentially-arranged gaseous fluid nozzles leading into said inlet chamber from a source of gaseous fluid under pressure, a by-pass duct extending from the outer periphery of that portion of said classification chamber which is adjacent to said downstack to that portion of said inlet chamber which is adjacent to said downstack and to said feed inlet, reject means in said by-pass duct



for removing the heavier particles passing through said by-pass duct while the lighter particles continue to move through said by-pass duct into said inlet chamber, said reject means comprising a slot in the outer peripheral wall of said by-pass duct, said slot being in communication with a separator for separating heavier rejected particles from lighter rejected particles and gaseous fluid, and blow-back means for passing gaseous fluid under low pressure through said slot into said by-pass duct.

4,131,240

EXPANDABLE MANDREL REEL

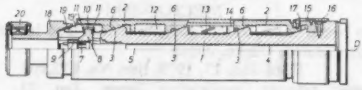
Werner Keulertz, Duisburg, and Karl-Heinz Wessel, Dinslaken, both of Germany, assignors to DEMAG, Aktiengesellschaft, Duisburg, Germany

Filed Oct. 14, 1977, Ser. No. 842,369

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1976, 2548197

Int. Cl.[2] B65H *75/18*

U.S. Cl. 242—72.1 **10 Claims**



1. An expandable mandrel reel for coiling strip-like rolling material, particularly hot strip, comprising

(a) a mandrel shaft;

(b) a plurality of expandable mandrel segments disposed along said shaft;

(c) a tie rod axially displaceable in said shaft and connected to said segments;

(d) a plurality of cooperating opposed wedge faces disposed between said shaft and said segments;

(e) said faces inclined from the axis of said shaft in the longitudinal direction thereof; the improvement characterized by

(f) said shaft being square in cross section;

(g) each face of said shaft having a centrally disposed rectangular extension extending radially therefrom forming fins;

(h) each said fin forming a pair of parallel flanks;

(i) a lateral guide for said segments on each flank of each fin;

(j) each said segment having a cooperating recess for engaging said lateral guides;

(k) the said plurality of cooperating wedge faces for each segment disposed internally thereof;

(l) the said plurality of cooperating wedge faces for said shaft disposed directly on said shaft; and

(m) the said wedge faces on said shaft positioned at right angles to said fin flanks.

4,131,241

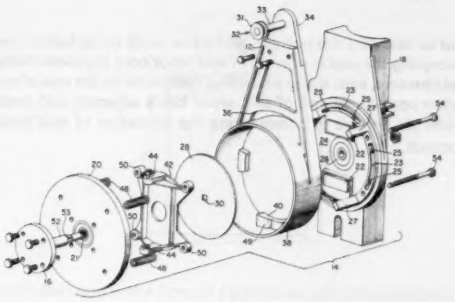
STRAND DISPENSING DEVICE

Harry F. Meier, Cincinnati, Ohio, assignor to Alaskaug, Inc., Cincinnati, Ohio

Filed Sep. 15, 1977, Ser. No. 833,568

Int. Cl.[2] B65H *59/04*

U.S. Cl. 242—156.2 **3 Claims**



1. A strand dispensing device comprising:

a support means for supporting a storage apparatus for strand material; said support means being selectively rotatable;

a self-contained mechanical brake means affixed to and cooperating with said support means to selectively prevent rotation of said support means; and

a lever means engagably affixed to said mechanical brake means for guiding said strand material and for engaging and disengaging said mechanical brake means; said brake means having:

a first brake pad fixedly attached to a stationary first pad support means;

a second brake pad fixedly attached to a non-rotatably fixed second pad support means, said first and second brake pads being in face-to-face relationship;

a brake disk disposed between said first and second brake pads, said brake disk being affixed to said support means for supporting a storage apparatus for strand material;

a resilient means for urging said second pad support means toward said first pad support so as to engage said brake disk with said first and second brake pads; and

a wedge means fixedly attached to said lever means for separating said first and second brake pads, said wedge means having a wedge support rotatably mounted on said first pad support means and fixedly attached to said lever means, and a plurality of wedge blocks fixedly attached to said wedge support and engaging said second pad support means.

4,131,242

UNIVERSAL WINDING ARBOR

Salomon S. Flores, 2046 N. Kedvale, Chicago, Ill. 60639

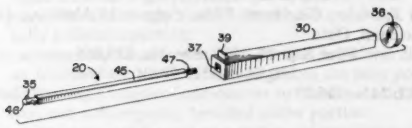
Continuation-in-part of Ser. No. 719,404, Sep. 1, 1976, abandoned. This application Mar. 21, 1977, Ser. No. 779,309

Int. Cl.[2] B65H *75/02*

U.S. Cl. 242—1 **1 Claim**

1. A universal winding arbor for use in forming transformers comprising the combination of an arbor core and an arbor block, said arbor core having a center portion of polygonal cross section with first and second end portions of relatively smaller circular cross section, said arbor core extending substantially through said arbor block for substantial enclosure of

said center portion, said first and second end portions protruding on opposite sides of said arbor block and said first portion being threaded for acceptance of a nut, a pin through said second end portion opposite said first end portion, said pin being biased against said arbor block by the tightening of said



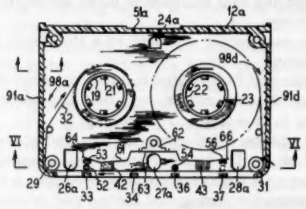
nut on said first end portion, said arbor block being hollow and accepting the center portion of said arbor core in a close-fitting relationship, and, a stop extending transverse to the axis of said arbor core on an end of said arbor block adjacent said transverse pin for use in commencing the formation of said transformers.

4,131,243

TAPE CASSETTE

Tetsuo Machida, Tagajyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Division of Ser. No. 701,678, Jul. 1, 1976, Pat. No. 4,062,506. This application Aug. 3, 1977, Ser. No. 821,357
Claims priority, application Japan, Jul. 23, 1975, 50-102221
Int. Cl.[2] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—199 **4 Claims**



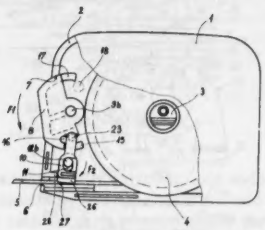
1. A tape micro-cassette formed of molded plastic and having a pair of mating lower and upper cassette members and a pair of sidewalls at opposite ends thereof, and including a pair of tape reels rotatably mounted in said cassette with thin film magnetic tape extending between said reels and said tape wound on said reels such that it is payed out from one reel and taken up by the other reel on the sides of said reels adjacent said pair of sidewalls and said tape travels substantially parallel and in close proximity to said pair of sidewalls and said cassette having a portion available for recording and playback functions along a front wall of said cassette which has an open area, a pair of guide rollers for said tape mounted in the corners of said cassette between said front wall and said pair of sidewalls, respectively, a plurality of tape guides extending generally parallel to said front face of said cassette and providing guides for said tape at said front face and said inner walls of said pairs of sidewalls, said sidewalls being formed with roughened areas so that as the tape is payed out from one reel and taken up by the other reel it contacts the roughened areas of said inner pair of sidewalls, which prevents said thin film tape from adhering to said pair of sidewalls.

4,131,244

TAPE MEASURE BRAKE

Michel Quenot, Besancon, France, assignor to Stanley-Mabo S.A., Besancon, France

Continuation of Ser. No. 776,305, Mar. 10, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 864,834
Claims priority, application France, Mar. 29, 1976, 76 09869
Int. Cl.[2] B65H *75/48*; G01B *3/10*
U.S. Cl. 242—107.2 **11 Claims**



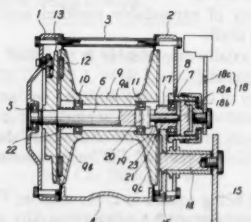
8. In a tape rule or the like linear measuring instrument comprising a casing having an outlet slot for a measuring-tape wound on a winding drum, a tape return spring and a tape locking device which comprises a control button and a brake block which in a locking position grips the tape against an inner bearing face of the casing, the improvement in which the tape locking device comprises first and second levers pivotally connected together about a common first pivoting axis to form an elbow-joint, the first lever forming the control button and being tippably mounted about a second fixed pivoting axis, the second lever extending to an end part forming said brake block and being tippably mounted about a third axis and movable in translation towards and away from the tape, said levers being able to tip between an unlocking position in which said first pivoting axis is spaced apart on one side of a line of junction connecting said second and third pivoting axes and the brake block is spaced apart from the tape, and a locking position in which said first pivoting axis is located on the other side of said line of junction with said brake block coacting with the tape.

4,131,245

FISHING REEL HAVING AN IMPROVED DRAG MECHANISM

Hideo Noda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jan. 27, 1978, Ser. No. 872,902
Claims priority, application Japan, Jan. 31, 1977, 52-11065[U]; Jan. 31, 1977, 52-11066[U]
Int. Cl.[2] A01K *89/02*
U.S. Cl. 242—217 **10 Claims**



1. A fishing reel comprising:
a pair of substantially parallel spaced apart housings;
a spool spindle journaled between said housings;
a spool having a trunk and a pair of flanges formed at opposite axial ends of said trunk;

means for supporting said spool on said spindle such that said spool is rotatable and axially movable with respect to said spindle;

a handle operative to rotate said spindle;

a master gear through which said spindle is rotated by said handle;

a drag mechanism for frictionally transmitting the rotation of said spindle to said spool; and

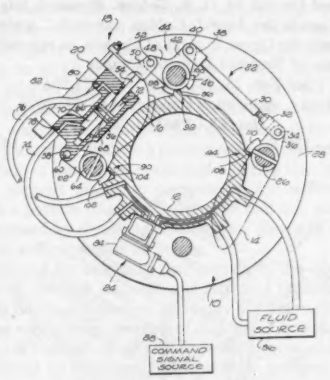
a control mechanism for moving said spool axially of said spindle to control the driving force transmitted from said drag mechanism to said spool; said drag mechanism comprising: a drag plate and a friction plate, said drag plate being fixed to said spindle and normal to the axis of said spindle, said friction plate being mounted to the outer lateral surface of one of said flanges which is opposite to said drag plate, said control mechanism being operative to move said spool in one axial direction with respect to said spindle to bring said friction plate into contact with said drag plate, thereby frictionally transmitting the rotation of said handle to said spool, said control mechanism being further operative to move said spool in the other axial direction with respect to said spindle to remove said friction plate from contact with said drag plate, thereby allowing said spool to freely rotate.

4,131,246

THRUST VECTOR CONTROL ACTUATION SYSTEM

Richard J. Rotmans, Saugus, Calif., assignor to Textron Inc., Providence, R.I.

Filed Feb. 4, 1977, Ser. No. 765,713
Int. Cl.[2] F02K *1/20*
U.S. Cl. 244—3.22 **6 Claims**



1. A thrust vector or control system for a rocket motor having a nozzle exit end comprising:

a pair of opposed control spoiler blades pivotally attached adjacent said nozzle exit end;

actuator means;

mechanical linkage means;

first means for connecting said actuator means to one of said spoiler blades; and

second means for connecting said linkage means between the other of said spoiler blades and said actuator means.

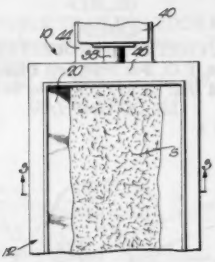
4,131,247

APPARATUS FOR REDUCING FRAGMENTARY STOCK

Victor Danberg, 6 Mary Ann Ln., Wallingford, Conn. 06492

Continuation-in-part of Ser. No. 712,656, Aug. 9, 1976, abandoned. This application Aug. 26, 1977, Ser. No. 827,885
Int. Cl.[2] B02C *23/38*
U.S. Cl. 241—49 **2 Claims**

1. Apparatus for reducing fragmentary stock into smaller particles, comprising a chamber with an axis having a peripheral wall about said axis and opposite endwalls, and stock inlet and outlet passages leading to and from said peripheral wall; a sizing screen in said chamber in cover relation with said outlet passage; a rotor in said chamber having a hub mounted for rotation about said axis and being inwardly spaced from said peripheral wall by an annular gap, and angularly spaced cutting tools on and turning with said hub and projecting outwardly therefrom into said gap, with said cutting tools being blades having turning cutting edges and being disposed in a ring-shaped path about said axis; stationary cutting tools on said peripheral wall, said turning tools acting to centrifugally force stock in said chamber into an annular formation and to



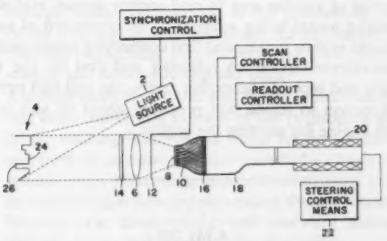
propel the same in the form of a stream on said peripheral wall, with said stationary and turning cutting tools cooperating to cut said stock into particles for passage through said screen; and fan means in said chamber outlet, with each of said endwalls having within the cylindrical confines of said path an opening through which said gap is exposed to the atmosphere so that on operation of said fan means the ensuing draft of atmospheric air enters said chamber through said openings into said gap, and passes through the stock stream and then through said screen and chamber outlet, with said turning cutting tools agitating the air drawn by said fan means into said gap through said openings and thereby keeping the stock in said stream in a turbulent condition.

4,131,248

OPTICAL RANGE RESOLUTION SYSTEM

David B. Berglund, Grand Prairie, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Filed Mar. 13, 1968, Ser. No. 712,722
Int. Cl.[2] F42B *15/02*; F41G *9/00, 11/00*
U.S. Cl. 244—3.16 **12 Claims**



1. Sensor apparatus for guidance systems, said sensor apparatus comprising:

means receiving light of a single pulse reflected from a target area and focusing said reflected light to form a two-dimensional image,

means receiving said two-dimensional image and operable to convert said two-dimensional image into a quantized, straight line image,

means receiving said straight line image and converting said

straight line image into a two-dimensional display wherein each quanta of said straight line image is displayed in a time-dependent position,

means receiving said two-dimensional display and converting said display into an electrical signal,

steering control means forming a part of said guidance system, and

means applying said electrical signal to said steering control means.

4,131,249

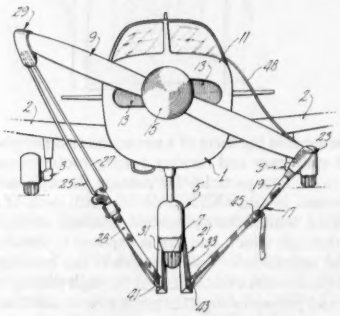
EXTERNAL PORTABLE PROPELLER ROTATOR

Ronald S. Watson, P.O. Box 9599, San Diego, Calif. 92109

Filed Dec. 23, 1977, Ser. No. 863,984

Int. Cl.[2] B64F *1/34*

U.S. Cl. 244—53 A **12 Claims**



1. A device for starting an aircraft engine which is capable of being started by rotating a propeller connected thereto comprising a first connecting means for holding said propeller in a desired fixed position, a second connecting means for applying a force on said propeller for rotating said propeller, said first connecting means including a first tip cap means at one end adapted to be placed on one blade tip of said propeller, said second connecting means including a second tip cap means at one end adapted to be placed on another blade tip of said propeller, an anchor means for positioning below said aircraft propeller, said first connecting means being adapted to be connected at another end to said anchor means, said second connecting means being adapted to be connected at another end to said anchor means, said first connecting means including a quick-release device for releasing said first tip cap means whereby said second connecting means can pull said propeller in a direction to rotate said propeller about its axis on said aircraft engine for starting the engine.

4,131,250

HELICOPTER BLADE ICE PROTECTION SYSTEMS

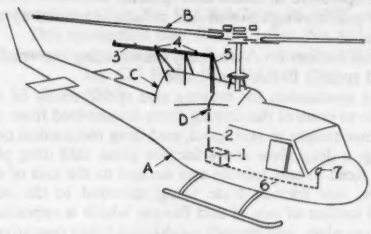
Earle T. Binckley, 31812 National Park Dr., Laguna Niguel, Calif. 92677

Filed Jun. 13, 1977, Ser. No. 806,091

Int. Cl.[2] B64D *15/10*

U.S. Cl. 244—134 R **1 Claim**

1. A means for preventing the accumulation of ice on a helicopter main rotor blade, the system comprising a tank for carrying the supply of freezing point depressant fluid, a pump mounted in the tank to move the fluid from the tank through tubing to the nozzles, said pump to be actuated by a switch accessible to the pilot, tubing between the tank and the nozzles for carrying the fluid, a nozzle array mounted in the shadow



area of the rotor mast, external to the helicopter, and that sprays the fluid upward into the path of the rotor blades.

4,131,251

AERIAL DELIVERY WEDGE

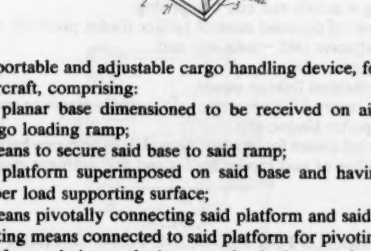
Robert G. Lloyd, Trenton; Anthony C. Street, Winnipeg, both of Canada, and Donald M. G. R. Golden, deceased, late of Edmonton, Canada (by Jean J. Golden, executrix), assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Canada

Filed Feb. 25, 1977, Ser. No. 771,986

Claims priority, application Canada, Mar. 11, 1976, 247709

Int. Cl.[2] B64D *1/08*

U.S. Cl. 244—137 R **14 Claims**



1. A portable and adjustable cargo handling device, for use in an aircraft, comprising:

(a) a planar base dimensioned to be received on aircraft cargo loading ramp;

(b) means to secure said base to said ramp;

(c) a platform superimposed on said base and having an upper load supporting surface;

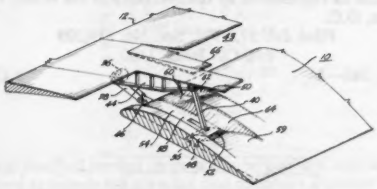
(d) means pivotally connecting said platform and said base;

(e) lifting means connected to said platform for pivoting the platform relative to the base to selectively vary the angle of inclination of the load supporting surface relative to a plane defined by said base so that when said ramp is in a closed position said platform is in a substantially horizontal plane within said aircraft; said platform including friction reducing means on the load supporting surface thereof to facilitate sliding movement of a load thereover.

4,131,252
APPARATUS FOR COMPENSATING FOR AIRFLOW BLOCKAGE IN AIRCRAFT SLOTTED FLAP ASSEMBLIES

Roy D. Dean, and Richard H. Weiland, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 696,398, Jun. 15, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,530
Int. Cl.² B64C 9/02
U.S. Cl. 244—212 **16 Claims**



12. In an airplane flap assembly including a flap having an upper surface and a lower surface and an airplane wing wherein said flap is attached to extend spanwise along the trailing edge of said wing by at least one support means that extends between said wing and said flap, said flap being positionable relative to said wing to define a spanwise airflow slot between said wing and the upper surface of said flap for directing air over the upper surface of said flap with said slot extending for substantially the full spanwise dimension of said flap and said support means being disposed in the airstream directed through said airflow slot, said flap being retractable to define a substantially continuous aerodynamic surface with said airplane wing, said upper surface of said flap including a recessed region extending rearwardly from the leading edge of said flap to an aft terminating edge located forwardly of the trailing edge of said flap, said recessed region for receiving at least a portion of said support means when said flap is retracted, wherein the improvement comprises airflow means for directing a stream of air to a predetermined rearwardly extending portion of said upper surface of said flap that is contiguous to said support means to compensate for airflow blockage through a portion of said slot between said flap and said wing that is caused by disposing said support means in said airflow slot, said airflow means including:

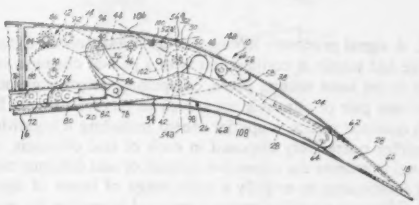
a rampway for directing that portion of the airflow which passes through said slot and into said recessed region of said flap upper surface upwardly and rearwardly for passage across a first portion of said upper surface of said flap that is located aft of said recessed region, said rampway defining an aerodynamically smooth inclined surface between said aft terminating edge of said recessed region and said first portion of said upper surface of said flap; and

an airflow duct extending between an air inlet opening in the lower surface of said flap and an air outlet opening in the upper surface of said flap, said air inlet opening being located rearwardly of said flap leading edge and having a spanwise dimension substantially less than the spanwise dimension of said flap, said air outlet opening being located outboard of and substantially adjacent to said recessed region at a position intermediate to said leading edge of said flap and said aft terminating edge of said recessed region, said outlet opening having a spanwise dimension substantially less than the spanwise dimension of said flap, said airflow duct being configured and arranged to discharge the airstream passing through said airflow duct for rearward flow along at least a portion of said predetermined region of said flap upper surface in which said airflow blockage occurs, said airflow duct and said rampway being further configured and arranged for supplying airflow of sufficient volume and velocity to cause the combined airflow provided to said blocked airflow region by said airflow duct and by said airflow slot to energize a boundary layer of air along said blocked airflow region of said upper surface of said flap.

4,131,253
VARIABLE CAMBER TRAILING EDGE FOR AIRFOIL

Edwin J. Zapel, Hobart, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 21, 1977, Ser. No. 817,541
Int. Cl.² B64C 3/48
U.S. Cl. 244—219 **15 Claims**



1. A variable camber airfoil comprising:

a. a support frame,

b. upper and lower skins attached to said frame,

c. a trailing edge end section,

d. a variable camber upper skin section extending from said frame to said trailing edge end section,

e. a variable camber lower skin section connecting to the trailing edge end section and extending forwardly therefrom toward said frame,

f. a walking beam positioned between the upper and lower variable camber skin sections, said walking beam comprising a forward positioning section and a rearwardly extending locating arm,

g. positioning means to locate said forward positioning section of the walking beam relative to said frame, said positioning means comprising:

1. a first forward connecting means interconnecting a forward connecting portion of the positioning section of the walking beam to said frame for movement of the forward connecting portion back and forth on an upwardly and forwardly slanting path,

2. a second rearward connecting means interconnecting a rearward connecting portion of the positioning section of the walking beam to the frame for movement back and forth on an upwardly and rearwardly slanting path, whereby said positioning section is constrained to move in a manner that forward movement thereof rotates said locating arm downwardly, and rearward movement thereof rotates said locating arm upwardly,

h. a trailing edge beam, comprising:

1. a forward portion connected to said frame,

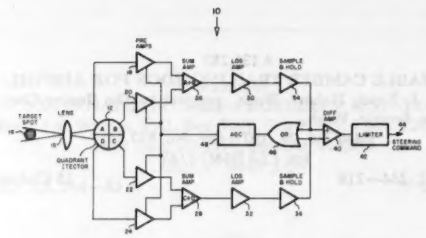
2. a rear portion connected to said trailing edge end section,

3. an intermediate portion connected to said locating arm, whereby downward or upward rotational movement of the locating arm of the walking beam causes a corresponding downward or upward rotational movement of the trailing edge beam of a correspondingly greater degree of rotation relative to said locating arm.

4,131,254
WIDE INSTANTANEOUS DYNAMIC RANGE PROPORTIONAL SIGNAL PROCESSOR

William C. Underwood, Orlando, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.

Continuation of Ser. No. 181,616, Sep. 17, 1971, abandoned. This application Apr. 19, 1976, Ser. No. 678,508
Int. Cl.[2] F41G 7/00, 7/18; G01S 9/02
U.S. Cl. 244—3.16 23 Claims

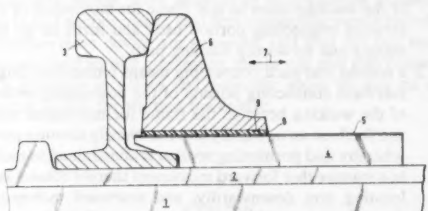


1. A signal processor having a wide instantaneous dynamic range and usable in conjunction with a pair of channels relatable to the same sensing plane, comprising detector means, at least one pair of channels connected to receive outputs from said detector means, amplifier means including a logarithmic amplifier operatively disposed in each of said channels, connected to receive the respective outputs of said detector means and functioning to amplify a wide range of levels of signals, and difference amplifier means connected to receive the output of said channels, and serving to produce a signal the polarity of which is indicative of the channel having the higher output, such that appropriate commands can be generated, and sample and hold means in each channel and utilized for converting pulse type signal outputs into signals of longer duration, thus to provide sufficient time for the comparison by said difference amplifier means of the outputs of said channels.

4,131,255
RAIL SWITCH ARRANGEMENT

Manfred Menia, Hard, Austria, assignor to Heinz Faigle, Hard, Austria

Filed Feb. 4, 1977, Ser. No. 765,543
Claims priority, application Austria, Feb. 9, 1976, 877/76; Oct. 14, 1976, 7670/76
Int. Cl.[2] E01B 7/00
U.S. Cl. 246—430 10 Claims



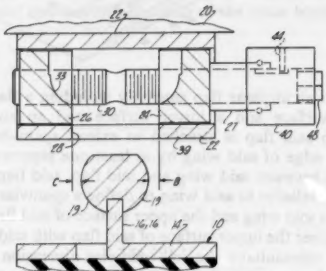
1. In a rail switch arrangement including a support an elongated rail fixedly mounted on said support, and an elongated rail blade mounted on said support for movement toward and away from a position contiguously adjacent said fixedly mounted rail, said support having a substantially horizontal top face and said blade having a bottom face, the improvement which comprises:

(a) a frame formed with an opening;
(b) fastening means fastening said frame to said bottom face and
(c) a sheet member of synthetic resin composition fixedly received in said opening and slidingly engaging said top face during said movement of the rail blade.

4,131,256
ENGINE MOUNT

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 27, 1977, Ser. No. 819,309
Int. Cl.[2] B60K 1/00
U.S. Cl. 248—3 3 Claims



1. An engine mount comprising a vehicle-attached base; an engine-attached hollow rail adapted to rest on the base; said base having an engine hold-down element adapted to project through an opening in a lower surface of the rail so that said element assumes a centralized position in the rail interior; two spaced-apart jaws slidably positioned within the rail at opposite sides of the hold-down element; and a screw threaded through said jaws for moving same into clamped positions against opposite side surfaces of the hold-down element; the screw threads engaged with one jaw being right-handed, and the screw threads engaged with the other jaw being left-handed, whereby the jaws move simultaneously toward the hold-down element; the jaws and screw being freely adjustable as a unit on the rail, whereby the jaws apply equal pressures on the hold-down element; said screw having an actuator end located outside the hollow rail; one of said jaws having a tubular shield surrounding the screw actuator end to obstruct access thereto when the jaws are spread apart to a maximum permissible distance.

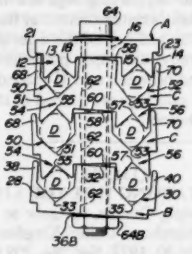
4,131,257
STACKING CABLE CLAMP

Maurice Sterling, Willow Grove, Pa., assignor to Eby Company, Philadelphia, Pa.

Filed Nov. 14, 1977, Ser. No. 851,137
Int. Cl.[2] F16L 3/10; H01R 7/24
U.S. Cl. 248—67.5 5 Claims

1. A cable clamp comprising first and second outer jaw members and at least one intermediate jaw member adapted to be retained between said first and second outer jaw members, each said intermediate jaw member including a pair of spaced female portions contained within one side thereof and a pair of spaced male portions projecting from an opposite side thereof, said first outer jaw member including a pair of spaced male portions, said second outer jaw member including a pair of spaced female portions, said pairs of male portions loosely interfitting within corresponding pairs of female portions and including abutting limit stops at the interfaces therebetween, V-shaped notches longitudinally extending in each of said male portions, and V-shaped grooves longitudinally extending in

each of said female portions to define diamond shaped pigeon hole jaws when said male and female portions interfit with each other, lateral guides at the outer margins of each of said female portions, and bolt means loosely passing through bores



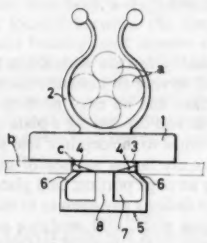
in said first and second outer jaw members and said intermediate jaw members for drawing said members together whereby a plurality of cables of different diameters can be stacked in fixed disposition with each other without pinching.

4,131,258

CONNECTOR FOR PLATES

Seiji Okuda, and Takuo Yuda, both of Yokohama, Japan, assignors to Nifco, Inc., Tokyo, Japan

Filed Jun. 14, 1976, Ser. No. 695,355
Claims priority, application Japan, Jun. 13, 1975, 50/79428
Int. Cl.[2] F16B *13/10*; F16L *3/02*
U.S. Cl. 248—73 **9 Claims**



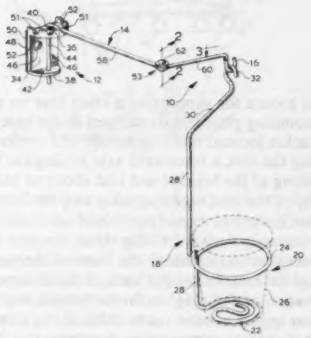
1. A one-piece plastic connector adapted for use in a polygonal shaped aperture in a flat plate, including an imperforate head portion, operating means disposed on one surface of said head portion, a noncircular fitting portion means disposed on the other surface of said head portion and having means defining a configuration substantially complimentary to the shape of said polygonal aperture in said plate, said fitting portion means including slanted surfaces tapering toward each of the corners thereof in the direction of said head but terminating in axially spaced relation to said head, a centrally disposed resilient plate-like anchor member extending axially out from and angularly disposed relative to said slanted surfaces on said fitting portion, said member having side-to-side dimension slightly smaller than the largest dimension of the aperture in said plate but greater than the distance between opposite sides of said polygonal aperture, said member being provided with inclined shoulders on the sides where the anchor member joins said fitting portion, said anchor member further including a pair of through apertures that form a centrally disposed rigid post-like member extending from the distal portion of the transverse surfaces of said plate-like member to the center of said imperforate head with its associated noncircular fitting portion, a free entering end including relatively flexible beam-like transverse portions extending radially outwardly from said post-like member a substantial extent, a pair of resilient substantially uniform thickness side walls extending generally perpendicular from the ends of said transverse member to a point intermediate the axial extent of said post-like member and thence angularly inwardly to their point of attachment to said fitting portion to thereby provide inclined shoulders in the form of resilient cam surfaces whereby upon application to a complimentary apertured workpiece said side walls and said free entering beam-like end portions flex during rotation until said fitting portion is seated in said aperture.

4,131,259

SWINGING CUP HOLDER

Peter Franks, 77 Anglesey Blvd., Toronto, Ontario, Canada

Filed May 10, 1977, Ser. No. 795,638
Int. Cl.[2] A01G *9/02*
U.S. Cl. 248—311.1 R **6 Claims**



1. A suspension holder for a beverage cup and which comprises;

a mounting member adapted to be secured upon a structural member and having upper and lower flanges extending in a generally horizontal manner therefrom, registering opening means formed in said upper and lower flanges, upstanding lug means formed around said upper flange, and defining therebetween a plurality of recesses spaced radially around said opening;

a support member comprising elongated arm means, and joint means incorporating pivot means whereby a portion of said elongated arm means may be swung relative to another portion thereof, and a generally vertical leg at an inner end of said elongated arm means, shaped and dimensioned to fit rotatably within said registering openings in said upper and lower flanges, and an adjacent portion of said elongated arm means being shaped and dimensioned to fit between two adjacent said lug means whereby to secure said elongated arm means in a predetermined rotational position relative to said mounting means, and being adjustable between said rotational positions by raising of said leg means and swinging of said arm means into a new position between two further said lug means;

coupling means at the free end of said elongated arm means;

a hanger comprising a linear spine portion and an upper portion extending from an upper end of said spine angularly upwardly with respect thereto;

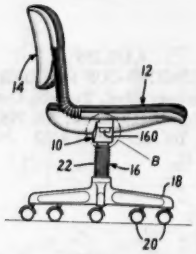
releaseable hook means at the upper end of said hanger, being releaseably interengeable with said coupling means whereby said hanger may be suspended therefrom, and,

a cup-holder secured to the lower end of said spine portion of said hanger, and said hook means on the upper end of said hanger being disposed generally axially relative to said cup holder.

4,131,260
CHAIR SEAT MOUNT WHICH PERMITS THE SEAT TO TILT FORWARD

Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles

Continuation-in-part of Ser. No. 795,098, May 9, 1977. This application Feb. 7, 1978, Ser. No. 875,801
Int. Cl.² A45D *19/04*
U.S. Cl. 248—384 **34 Claims**

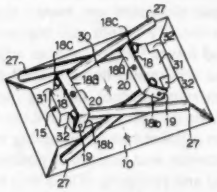


1. A seat mount for supporting a chair seat on a base comprising a mounting plate rigidly secured to the base, a seat-supporting bracket located under generally the center of the seat and carrying the seat, a transverse axle joining the bracket and plate for tilting of the bracket and seat about an axis extending transversely of the seat, co-engageable stop surfaces associated with the bracket and plate and positioned relative to each other to engage and stop forward tilting when the seat is tilted to a forward rake position in which the front of the seat is located a substantial distance below the back of the seat and the seat is at an inclination of about 4½° to the horizontal, and at least one compression spring located rearwardly of the axis of the axle and engaged under compression between the bracket and mounting plate and yieldably restraining the bracket and thus the seat from tilting forward about the axis.

4,131,261
FOLDING MEANS FOR SUPPORTING LEGS OF ROASTER OVEN WITH HIGH STABILITY

Min-Ching Shy, 20 Alley 18, La. 109 Hoping St., Yang Ho Town Taipei Hsien, Taiwan

Continuation-in-part of Ser. No. 757,054, Jan. 5, 1977, Pat. No. 4,063,703. This application Sep. 28, 1977, Ser. No. 837,475
Int. Cl.² F16M *11/32*; F24C *15/08*
U.S. Cl. 248—439 **5 Claims**

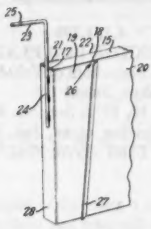


1. Foldable means for supporting legs of a roaster oven or the like having an oven body, an oven belly extending from said oven body, tongue portions extending from opposite ends of said oven belly, said foldable means including a U-shaped frame pivotally connected on each of said opposite ends of said oven belly, each of said U-shaped frames being pivotally connected to said belly at ends of said side portions of the U-shaped frame located remotely from the intermediate portion of said U-shaped frame connecting the two side portions thereof, said tongue portion having a screw hole for reception of a locking screw provided on said intermediate portion when said frame is adjusted so the said screw is in line with said hole, a button on said screw for effecting rotation thereof and consequently advancement or retraction of said screw, a pair of supporting legs structurally related with each of said U-shaped frames, said structural relationship being characterized in that upper portions of said supporting legs are fixed to said U-shaped frame structurally related thereto at the intersection of the intermediate portion and one of the sides internally of said U-shaped frame whereby said upper portions of said supporting legs will be located between said U-shaped frame and said tongue portion when said legs are placed in standing position to enhance stability thereof.

4,131,262
DEVICE FOR RETAINING HOT TOP LINING SLABS

John W. Bowers, Guelph, Canada, assignor to Foseco International Limited, Birmingham, United Kingdom

Filed May 20, 1977, Ser. No. 799,057
Claims priority, application United Kingdom, May 27, 1976, 22122/76; Canada, Jul. 23, 1976, 257705
Int. Cl.² B22D *7/10*
U.S. Cl. 249—202 **8 Claims**



1. An end cap assembly for use with a hot top slab for a casting mold, said slab having an inwardly facing surface, an outwardly facing surface and an edge portion, said end cap assembly comprising an end cap having a plate portion whose height is substantially equal to the depth of said slab and which bears against the inwardly facing surface of said slab, and a wedging plate having an edge portion, said plate portion having one portion bent to define a passageway to receive the edge portion of the wedging plate, said wedging plate having a height substantially equal to the depth of said slab, the passageway in said plate portion being downwardly and outwardly inclined, with respect to the edge portion of said slab, means to secure the plate portion to said slab and suspension means connected to said end cap for supporting said end cap and said slab on said casting mold.

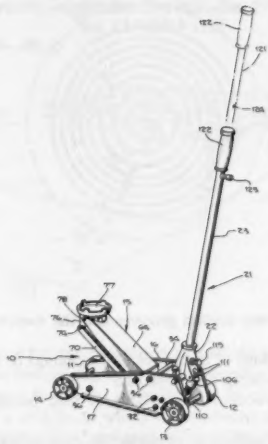
4,131,263
FIXED LIMIT LIFTING JACK

Julius F. John, Redondo Beach, Calif., assignor to Norco Industries, Inc., Gardena, Calif.

Filed Oct. 19, 1977, Ser. No. 843,595
Int. Cl.² B66F *5/04*
U.S. Cl. 254—8 B **12 Claims**

1. In a lifting jack comprising a frame, an elevating linkage pivotally mounted on the frame, a hydraulic housing on the frame having a hydraulic reservoir therein, and a hydraulic power cylinder operatively connected between said frame and said elevating linkage, the combination of a hydraulic network interconnecting said reservoir and said power cylinder and actuating means for said network, said network comprising a first bore in communication with said power cylinder and checked against return flow from said power cylinder, a second bore in communication with said reservoir and checked against flow to said reservoir, and a third bore in communication between said power cylinder and said reservoir, said third bore having an exposed outer end and a combined reverse

action and load limit subassembly in said third bore, said actuating means comprising a pump and a pump actuator pivotally mounted on said frame, said pump actuator including reverse control for said elevating linkage, said pump having a pump chamber in communication jointly with said first and second bores, whereby to draw fluid from said reservoir and force fluid into said power cylinder, said load limit subassembly comprising a check valve seat and a load limit check valve element in said third bore seating in a direction to stop flow to



said power cylinder, a bushing in fixed position closing the outer end of said third bore, a resilient actuator for said check valve element located between the load limit check valve element and said bushing, said reverse control comprising a stem member extending through said bushing into engagement with said resilient actuator, said stem member having an adjustment of position relative to said resilient actuator whereby to relieve tension in said resilient actuator to establish flow from said power cylinder to said reservoir and enable lowering of said elevating linkage.

4,131,264

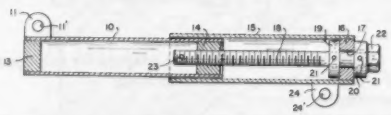
LOAD BINDER APPARATUS

William W. Patterson, III, and Eugene F. Grapes, both c/o W. W. Patterson Company 830 Brocket St., Pittsburgh, Pa. 15233

Continuation-in-part of Ser. No. 805,185, Jun. 9, 1977, abandoned. This application Dec. 27, 1977, Ser. No. 864,690

Int. Cl.[2] B66F *3/10*

U.S. Cl. 254—67 **9 Claims**



1. A load binder or lashing tightener apparatus comprising a first inner elongate sleeve member closed at one end, an anchor adjacent said closed end, a threaded nut fixed in the other end of said first sleeve, a second outer sleeve having one end adapted to telescope over the first inner sleeve in close fitting relationship, at least one anchor means on said second sleeve adjacent the other end, screw means extending through the second sleeve, one end threadingly engaging the nut in said first sleeve, the other end rotatably fixed in the said other end of said second sleeve and drive means on said other end for rotating said screw whereby said second sleeve is caused to telescope over the first sleeve and the anchor means on said sleeves are brought together, said sleeves being freely rotatable relative to one another, and wherein the sleeves are of cylindrical form having anchor means on each of said sleeves adjacent their remote ends extending radially outward from each sleeve generally on opposite sides from each other, said sleeves being freely relatively rotatable whereby said anchor means are free to align themselves to provide maximum pull through the binder.

4,131,265

SLAG POTS

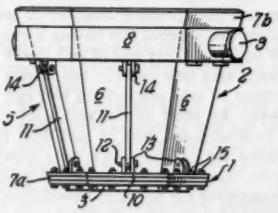
Walter A. McCray, 20200 Sheldon Rd., Cleveland, Ohio 44142

Filed Oct. 12, 1977, Ser. No. 841,516

Claims priority, application United Kingdom, Oct. 12, 1976, 42355/76

Int. Cl.[2] F27D *15/00*

U.S. Cl. 266—275 **5 Claims**



1. A slag pot comprising an upper portion formed of a plurality of metal plates welded together, constituting sidewalls of the pot and a lower portion floor of the pot secured to said sidewalls, lower out-turned lips extending from the lower edge of at least certain of said plates, said lips each having openings to permit the passage of bolts through said openings and corresponding openings in said floor in order to secure said floor to said sidewalls using bolts, upper out-turned lips extending from upper edges of at least certain of said plates, a trunnion ring of a shape dimensioned to fit about the upper edges of said plates, said trunnion ring carrying at least one pair of opposite trunnions, upper side supports mounted on said trunnion ring and lower side supports extending from said lower out-turned lips, hinged rods each secured to one of said upper and lower side supports to secure said trunnion ring whereby said trunnion ring may be removed by the separation of said bolts from said floor such that said floor may be replaced with a new floor by again securing said bolts in place.

4,131,266

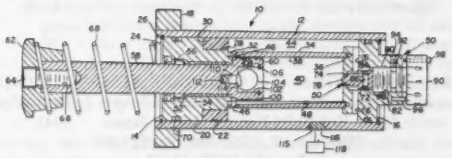
ADJUSTABLE SHOCK ABSORBER

Walter L. Carter, Troy, Mich., assignor to Jackson Machine Products, Madison Heights, Mich.

Filed Oct. 19, 1977, Ser. No. 843,561

Int. Cl.[2] F16F *9/48*

U.S. Cl. 267—34 **4 Claims**



1. A fluid shock absorber comprising:

a housing having a longitudinal bore;

a sleeve longitudinally positioned in said housing bore to define a piston chamber within said sleeve and an accumulator chamber in the annular space between said sleeve and said housing;

pressure fluid in said chambers;

a piston rod having a piston at its inner end, said piston having a rod end and a head end, said piston being slideably mounted in said piston chamber to divide said piston chamber into a high-pressure chamber at the head end of said piston and a low-pressure chamber at the rod end of said piston, the other end of said piston rod extending outwardly of one end of said housing to an initial position for engagement by a member to be decelerated;

first support means carried at said one end of said housing for slideably supporting said piston rod, said first support means sealingly engaging said housing while supporting one end of said sleeve in said longitudinal position;

second support means carried at the other end of said housing for sealingly engaging said housing while supporting the other end of said sleeve in said longitudinal position, said sleeve having a longitudinally disposed, tapered slot along its inside surface, said tapered slot providing a fluid passage axially along the outside surface of said piston connecting said high-pressure chamber to said low-pressure chamber, said tapered slot having a small cross-sectional area near said other end of said sleeve and a large cross-sectional area near said one end of said sleeve such that movement of said piston from said one end of said sleeve toward the other end of said sleeve reduces the effective cross-sectional area of said fluid passage and, thus, reducing the rate at which fluid flows from said high-pressure chamber to said low-pressure chamber;

means communicating the larger cross-sectional area end of said slot to said accumulator chamber;

said second support means having a through bore which terminates in a valve seat, said valve seat communicating with said high-pressure chamber;

said through bore having a radially disposed passage communicating with said accumulator chamber;

valve means disposed in said through bore, said valve means having a conically shaped end engaging said valve seat;

said valve means having a threaded body threadingly engaging said second support means;

said valve means having a knob at its external end, said knob having indicia thereon;

a stem, said stem being disposed between said conically shaped end and said threaded body, said stem slidingly engaging said through bore, said stem having a recess formed therein, said recess having means for sealingly engaging said through bore;

said conically shaped end being selectively movable toward and away from said valve seat by rotating said knob to provide an externally adjustable restriction between said high-pressure chamber and said accumulator chamber;

said second support member having a threaded bore laterally disposed and entering said through bore;

a lock screw carried in said threaded bore, said lock screw lockingly engaging said valve body;

a stop pin carried at the periphery of said knob, said pin projecting toward said second support member, and;

a second stop pin carried by said second support member, said second stop pin being engaged by said first pin to allow only one revolution of movement of said knob.

4,131,267

APPARATUS FOR HOLDING WORKPIECE BY SUCTION

Takatoshi Ono, and Michio Ikeda, both of Tokyo, Japan, assignors to Disco Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1978, Ser. No. 911,902
Int. Cl.[2] B25B *11/00*
U.S. Cl. 269—21 **8 Claims**

1. Apparatus for holding a workpiece by suction comprising

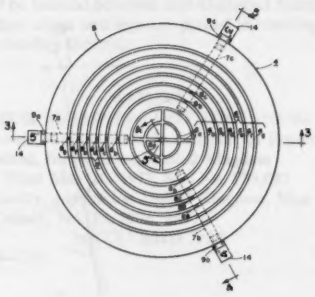
a table top having an upper surface and a plurality of separate grooves in said surface,

said table top having at least one radial bore extending under said grooves,

said bore being interconnected with at least some of said grooves by holes, respectively, to provide pneumatic communication therebetween,

a sleeve in said bore, said sleeve having a central axially extending passage therethrough, the position of said sleeve relative to said bore being independently changeable,

said sleeve having a plurality of openings axially alignable with said holes in said bore whereby pneumatic communi-



cation between certain grooves and the sleeve passage is established,

the axial locations of certain of said openings in the respective sleeves being different, and

a source of vacuum connectable to said passage of said sleeve,

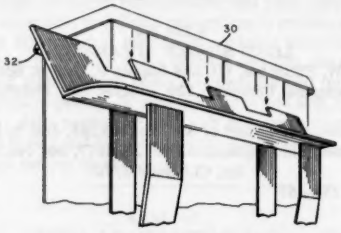
the number of said grooves subject to suction being changeable through selective change of the position of said sleeve relation to said bore.

4,131,268

RADIATOR CORE SUPPORT DEVICE

Gerard Valade, 23 Cliff Ave., Old Orchard Beach, Me. 04064

Filed Jun. 9, 1978, Ser. No. 913,952
Int. Cl.[2] B23Q *3/02*
U.S. Cl. 269—47 **4 Claims**



1. A radiator core support device adapted for use upon the sides of a radiator testing tank comprising:

a base member;

a first inner wall retainer member affixed to said base member;

a first outer wall retainer member affixed to said base member on an opposite side from said inner wall retainer member spaced apart from said inner wall retainer member a distance sufficient to allow a side of said radiator testing tank to pass therebetween;

a header lip catch member affixed to said base member and extending therefrom at an angle thereto;

a pair of header apertures defined along the upper edge of said header lip catch member; and

a clamp aperture centrally defined along the upper edge of said header lip catch member, said device adapted to be slidably movable along the side of said radiator testing

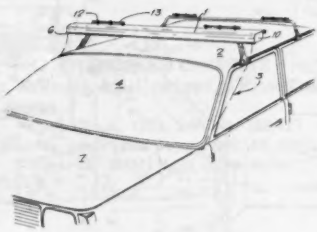
tank and adapted to support a radiator core when suspended therefrom.

4,131,269

DEVICE FOR PROTECTION OF VEHICLE WINDOWS AGAINST ICE OR FROST

Hans Brattrud, 2870 Dokka, Norway

Filed Jan. 25, 1977, Ser. No. 762,342
Claims priority, application Norway, Jan. 27, 1976, 760249
Int. Cl.[2] B60J 1/20
U.S. Cl. 296—95 Q 8 Claims



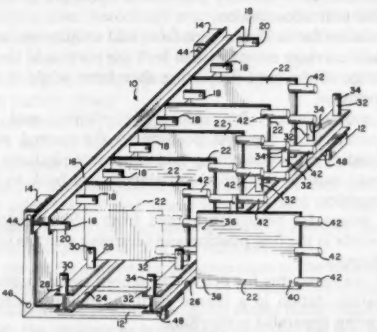
7. A device for the protection of vehicle windows against frost and ice comprising an elongated housing having a roller blind mounted therein to be pulled out to cover at least one window of a vehicle on which it is mounted; an electric heating means within a hollow core of the roller blind for melting snow and ice.

4,131,270

MEANS FOR POSITIONING STEAM CONDENSER TUBE SUPPORT PLATES

George J. Williams, Chalfont, and Robert C. Boyer, Bethlehem, both of Pa., assignors to Ecolaire Incorporated, Malvern, Pa.

Filed Apr. 22, 1977, Ser. No. 789,921
Int. Cl.[2] B25B 1/20
U.S. Cl. 269—321 W 7 Claims



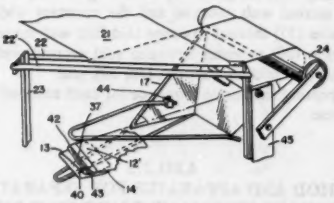
1. Apparatus for use in constructing a condenser comprising:
(a) an elongated generally L-shaped member defined by generally perpendicular legs,
(b) means at spaced points on said member to facilitate connection with a lifting means for lifting said member,
(c) means to facilitate locating tube support plates at spaced points along said member including a plurality of aligned sets of locating members, said sets of locating members being partially disposed on each of said legs at spaced points along the length of said L-shaped member.

4,131,271

METHOD AND APPARATUS FOR INTERFOLDING

Howard J. Slawny, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jun. 13, 1977, Ser. No. 806,107
Int. Cl.[2] B41L 1/30
U.S. Cl. 270—40 1 Claim



1. A method of sequentially folding elongated webs into Z-type configurations to achieve a continuous stack of interfolded webs comprising
(A) pulling first web material along a linear path of travel having longitudinally extending first and second vertical marginal planes (13, 14) and through the first of a series of horizontal spaced apart folding devices (17) in said path, each folding device consisting essentially of:
(i) a first planar part (25) having a generally trapezoidal shape providng a horizontal folding edge (26) extending transversely across said path and having first and second end points (27, 28) respectively in said first and second vertical marginal planes, said trapezoidal shape providing second and third folding edges (29, 30) extending respectively from said first and second margin end points upwardly and rearwardly relative to said path of travel and being upwardly divergent relative to each other,
(ii) a second planar part (31) having a generally triangular shape to provide a fourth folding edge (32) extending forwardly in said path from said first margin end point (27) and in said first vertical marginal plane (13), and a connecting edge (29′) connected to said first planar part (25) along said second folding edge (29), and
(iii) a third planar part (33) also having a generally triangular shape and having a fifth folding edge (34) extending from said first margin end point (27) diagonally forwardly relative to said path and across said path to terminate in said second vertical marginal plane (14), and a connecting edge (32′) connected to the fourth folding edge (32) of said second part (31),
(iv) said apparatus also including a sixth folding edge (35) connected at at least one end (36) thereof to one of said frame and its associated folding plate and extending diagonally across said path from a point slightly above said second margin end point (14) forwardly to said first vertical marginal plane (13), said sixth folding edge (35) being located above said fifth folding edge (34) and intersecting said first vertical marginal plane (13) a spaced distance rearwardly of the intersection of said fifth folding edge (34) with said second vertical marginal plane (14) whereby each folding plate has a triangular open bottom defined by said first (26) and fifth (34) folding edges and said second vertical marginal plane (14),
whereby said web material develops three longitudinally extending portions:
(a) a constant width middle portion (37) passing under said horizontal folding edge (26) and over said third planar part (33),
(b) a gradually widening upper portion (38) passing around said third folding edge (30) and under said sixth folding edge (35), and
(c) a gradually widening lower portion (40) passing

around said second folding edge (29), over said second planar part (31), around said folding edge (32) and rolling around said fifth folding edge (34),

(B) pulling second web material through the next device in said series while pulling the now Z-folded first web material under said next device and positioning the upper portion (38) of said first web material in contact simultaneously with the gradually widening lower portion (40) of the second web material and the constant width middle portion (37) thereof to cause said first web material upper portion (38) to enter between said second web material lower and middle portions (40, 37), and

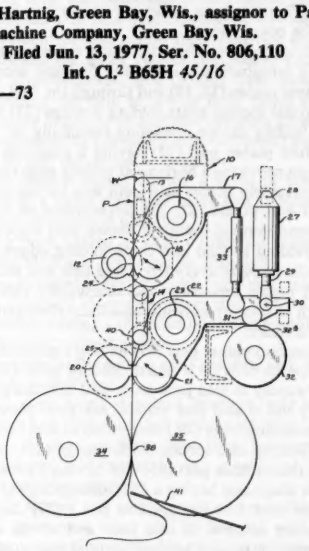
(C) repeating the above sequence for each successive folding device.

4,131,272

METHOD AND APPARATUS FOR SEPARATING A CONTINUOUS STREAM OF CONNECTED BUSINESS FORMS INTO EXACT COUNT ZIG-ZAG FOLDED STACKS

Richard E. Hartnig, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jun. 13, 1977, Ser. No. 806,110
Int. Cl.² B65H *45/16*
U.S. Cl. 270—73 **8 Claims**



1. In a method of separating a continuous stream of connected business forms into exact count zig-zag folded stacks for packaging, the steps of:

continuously advancing an elongated web along a linear path toward a station for zig-zag folding, said web including a longitudinally extending control margin and equally spaced apart lines of perforation defining business forms therebetween,

after a predetermined number of said lines of perforation have passed a point in said path, applying nipping forces to said web along transverse lines upstream and downstream of a given line of perforation and within the length of the business forms on either side of said given line of perforation, the downstream nipping force imparting a higher velocity to said web than the upstream nipping force whereby said web is burst along said given line of perforation,

removing at least said downstream nipping force from said web prior to the time the line of perforation subsequent to said given line of perforation passes the line of application of said upstream nipping force, and

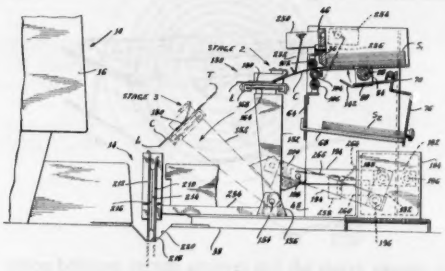
zig-zag folding said web in said station along each said line of perforation, the line of perforation immediately preceding said given line of perforation being gripped incident to zig-zag folding at about the time of web bursting along said given line of perforation.

4,131,273

RECORD CARD FEEDING APPARATUS

Fred W. Kufrin, Janesville, and John H. Carpentier, Ft. Atkinson, both of Wis., assignors to Oce-Industries Inc., Chicago, Ill.

Filed May 13, 1977, Ser. No. 796,677
Int. Cl.² B65H *5/10, 9/04, 9/10*
U.S. Cl. 271—4 **23 Claims**



1. An apparatus for feeding record cards to and from a utilization station in a record card utilization machine, said feeding apparatus comprising:

A. support means including

1. an origination hopper formed to hold a stack of cards prior to utilization, and

2. a collection hopper, spaced from said origination hopper, formed to receive cards after utilization;

B. an alignment platform in the region of the utilization station;

C. carriage means for receiving a card with at least a portion of a leading edge of the card projecting from said carriage means, for delivering the card to the utilization station and for returning the card for collection in said collection hopper, said carriage means being mounted for reciprocal, pivoted movement between a first card receiving and returning position in the proximity of said hoppers and a second card delivery position in operative proximity to the utilization station;

D. means for feeding a card from said origination hopper to said carriage means with at least the portion of the leading edge of the card projecting therefrom while in the first position;

E. motive means for reciprocally pivoting said carriage means from the first position to the second with said leading edge contacting said alignment platform to align said card in the utilization station and back to the first position; and

F. means for removing a card from said carriage means while in the first position and returning it to the collection hopper.

18. An apparatus for delivering record cards to and from a utilization station in a record card utilization machine, said delivering apparatus comprising:

A. support means including

1. an origination hopper formed to hold a stack of cards prior to utilization, and

2. a collection hopper, spaced from said origination hopper, formed to receive and stack cards after utilization,

B. carriage means for receiving a card from said origination hopper, delivering it to the utilization station and returning it to the collection hopper, said carriage means being mounted

1. for reciprocal pivoted movement between a first card receiving and returning position in the proximity of said

hoppers and a second card delivery position in operative proximity to the utilization station, and

2. for movement transverse to the plane of its pivoted movement; and

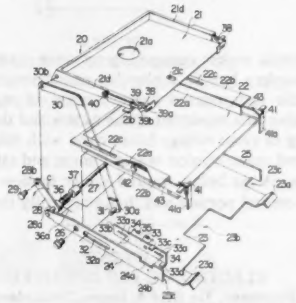
C. cam means, mounted at said utilization station, for engaging and moving said carriage means transversely to the plane of its pivoted movement into proper alignment in the utilization station to properly align at least one edge of a card received thereby for utilization by the machine.

4,131,274

SHEET FEED CASSETTE

Takaji Sue, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed Dec. 8, 1976, Ser. No. 748,757
Claims priority, application Japan, Dec. 15, 1975, 50/149900
Int. Cl.[2] B65H *1/28, 3/44, 3/56*
U.S. Cl. 271—9 **1 Claim**



1. A sheet feed cassette apparatus comprising:

a first sheet tray for receiving a stack of first sheets thereon;

a first pair of vertically movable corner claws disposed adjacent the front end of the first sheet tray along the opposite sides thereof and urged in a direction to retain the opposite corners of the leading end of a stack of the first sheets placed on the first tray;

respective projections operatively integral with each of the first corner claws;

a second sheet tray disposed below the first tray for receiving a stack of second sheets thereon;

a second pair of vertically movable corner claws disposed adjacent the front end of the second tray along the opposite sides thereof and urged in a direction to retain the opposite corners of the leading end of a stack of the second sheets placed on the second tray;

guide means formed on the opposite sides of the second tray for slidably carrying the first tray between a feed position and a non-feed position, the guide means being effective to guide the projections in a manner such that the first pair of corner claws associated with the first tray assume a lowered position when the first tray is in its feed position and assume a raised position when the first tray is retracted to its non-feed position;

a cassette frame for supporting the first and second sheet trays; and

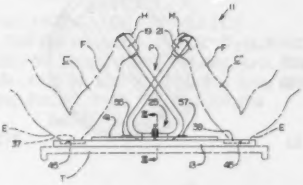
means for pivotably mounting the first tray on the cassette frame comprising a pair of support arms each having one of its ends pivotally connected with the rear end of the cassette frame and the other of its ends pivotally connected with the rear end of the first tray.

4,131,275

ARM WRESTLING DEVICE

Eleanor J. Gandy, and Ann H. Lockhart, both of 867 Maple Dr., Memphis, Tenn. 38108

Filed Sep. 1, 1977, Ser. No. 829,739
Int. Cl.[2] A63B *67/00;* **A63F** *9/00*
U.S. Cl. 273—1 R **10 Claims**



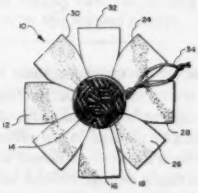
1. A device for use in contests in which two contestants attempt to force one another's forearm from a substantially vertical position to a substantially horizontal position, said device comprising: a base means; a first arm means including a grip member for being gripped by one of the contestants; a second arm means including a grip member for being gripped by the other of the contestants; and an attachment means for pviotally attaching said first and second arm means to said base means in such a manner that when said first or second arm means is forced to pivot downward by one of the contestants, the other of said first or second arm means will be forced to pivot downward a like amount; said first and second arm means crossing one another in such a manner that when said first arm means is forced downward by one of the contestants it will contact and press against said second arm means at the point where said first and second arm means cross one another and that when said second arm means is forced downwardly by one of the contestants it will contact and press against said first arm means at the point where said first and second arm means cross one another.

4,131,276

NON-INJURIOUS AMUSEMENT BALL AND METHOD OF MAKING SAME

Ren Judkins, 2260 Belaire Dr., Salt Lake City, Utah 84109

Filed Sep. 26, 1977, Ser. No. 836,630
Int. Cl.[2] A63B *43/02, 45/00, 37/14*
U.S. Cl. 273—58 C **7 Claims**



1. An amusement ball comprising:

a first plurality of resilient cellular foam strips each having an essentially uniform first length;

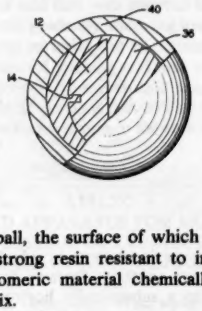
a second plurality of resilient cellular foam strips each having an essentially uniform second length that is shorter than said first length, said second foam strips being placed so as to essentially surround said first plurality of foam strips; and

a band placed around the middle of said first and second foam strips, said band being sufficiently tightened to cause said foam strips to be tightly gathered about their middle, thus forming a compact resilient core essentially enclosed by said foam strips, and said foam strips being bent to form an essentially spherical configuration.

4,131,277
BOWLING BALL

John L. Randolph, 1076 N. Jacoby Rd., Akron, Ohio 44321

Filed Nov. 14, 1977, Ser. No. 850,915
Int. Cl.² A63B 37/14
U.S. Cl. 273—63 D 10 Claims

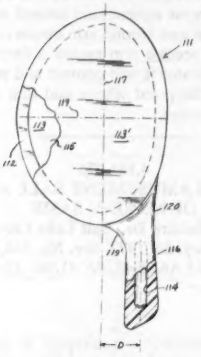


1. A bowling ball, the surface of which is composed of a matrix of hard, strong resin resistant to impact, containing domains of elastomeric material chemically bonded to the surrounding matrix.

4,131,278
GAME RACKET WITH SEMI-RESILIENT IMPACT SURFACES AND AN OFFSET HANDLE

Joseph Goldenberg, Hyattsville, Md., assignor to Pap-et, Inc., Washington, D.C.

Filed Jun. 7, 1977, Ser. No. 804,386
Int. Cl.² A63B 59/00
U.S. Cl. 273—67 R 3 Claims

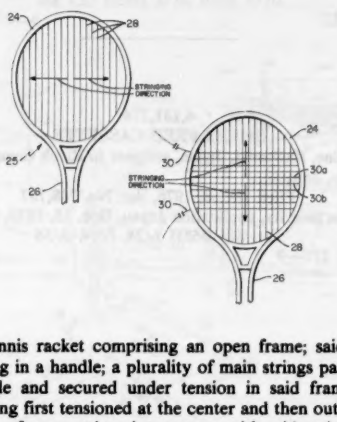


1. A game racket comprising a main body including means defining a flat sealed air chamber having resiliently yieldable plate-like striking surfaces, and a handle connected to said main body on an axis parallel to but offset from a center line of said main body by a distance sufficient to enable a user's index finger to supportingly engage behind said main body substantially at said center line, whereby to provide guiding support of the racket when striking a ball, wherein said main body comprises a rigid ring member with relatively thin plate-like front and rear panels peripherally sealingly secured on opposite sides of said ring member, wherein said ring member is substantially oval in shape and is continuously outwardly convex at its opposite lateral sides, the major axis of the ring member extending substantially parallel to said handle, wherein the radius of curvature of the ring member at the minor axis of the ring member is substantially greater at the lateral side thereof near the handle axis than at the lateral side thereof remote from the handle axis, and wherein the corner between said handle and the smaller-radius lateral side of the ring member is arcuately curved with a relatively short radius of curvature and the corner between said handle and the larger-radius lateral side of the ring member is arcuately curved with a relatively long radius of curvature, to facilitate gripping of the handle.

4,131,279
TENNIS RACKET AND STRINGING METHOD

John M. Ogden, 6540 Parkland Ave., Cincinnati, Ohio 45233

Filed Aug. 23, 1976, Ser. No. 716,425
Int. Cl.² A63B 51/00
U.S. Cl. 273—73 D 4 Claims

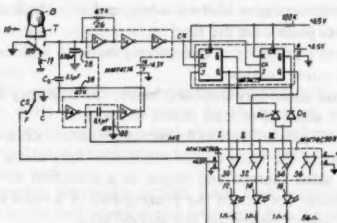


4. A tennis racket comprising an open frame; said frame terminating in a handle; a plurality of main strings parallel to said handle and secured under tension in said frame, said strings being first tensioned at the center and then outwardly; a plurality of cross strings interwoven with said main strings and secured under tension in said frames; and said main strings and cross strings being secured under tension in said frame from the central portion and then outwardly therefrom.

4,131,280
ELECTRONIC TEE OFF DEVICE

Karel A. Poortman, De Brei 4, Ingen, Netherlands

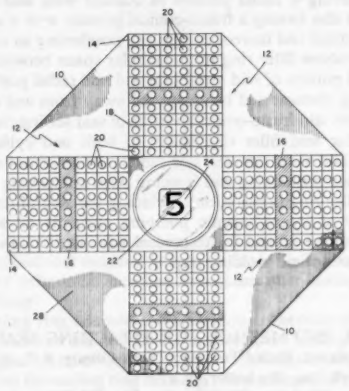
Continuation-in-part of Ser. No. 590,689, Jun. 26, 1975, Pat. No. 4,000,904. This application Dec. 28, 1976, Ser. No. 754,979
Claims priority, application Netherlands, Jul. 4, 1974, 7409067
Int. Cl.² A63B 69/36
U.S. Cl. 273—184 R 11 Claims



1. A tee-off device comprising tee means for supporting a golf ball which is to be driven from said tee means, said tee means having a pair of conditions one of which is a ball-supporting condition assumed by said tee means when the golf ball is supported thereby and the other of which is an empty condition different from said ball-supporting condition and automatically assumed by said tee means when a golf ball is driven therefrom, a plurality of light-source means situated adjacent said tee means at a location where any one of said light-source means when energized is visible to a golfer driving a golf ball from said tee means, said plurality of said light-source means respectively providing light of different colors when energized, preparatory circuit means operatively connected with

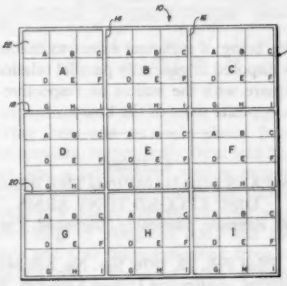
said plurality of light-source means for placing the latter in a condition remaining unenergized but ready to be energized in such a way that at any given instant only one of said light-source means is in a condition ready to be energized with the condition of being ready to be energized being transferred among the plurality of light-source means so that at any given instant the operator cannot know which of the differently-colored light-source means is in a condition ready to be energized, said tee means cooperating with said preparatory circuit means for rendering the latter operative only while said tee means is in said ball-supporting condition thereof, and operating circuit means operatively connected to said plurality of light-source means and said tee means for cooperating with said preparatory circuit means to energize momentarily in a haphazard manner only that one of said light-source means which happens to be in said condition ready to be energized when said tee means assumes said empty condition thereof upon driving of a golf ball therefrom, the location of the plurality of light-source means being such that the momentarily energized light-source means will only be visible to the golfer when he is properly positioned with respect to the golf ball carried by said tee means, whereby upon detecting a particular color from that one of said light-source means which has been haphazardly energized the golfer will know that he remained properly positioned up to the time when the golf ball has been driven.

4,131,281
GAME BOARD APPARATUS
Samson R. Taylor, 54 Bower St., Boston, Mass. 02119
Filed Nov. 21, 1977, Ser. No. 853,455
Int. Cl.² A63F *3/00*
U.S. Cl. 273—248 **3 Claims**



1. A game apparatus comprising:
an eight-sided game board having defined thereon four game zones, each of said game zones located adjacent to alternate sides of said game board, each of said game zones including a storage zone, a starting zone, and a playing zone, said storage zone having defined therein a plurality of marker receptacles positioned in six parallel columns positioned perpendicular to the side of said game board adjacent to the storage zone and five rows perpendicular to said columns, said starting zone having defined therein six marker receptacles each located at the end of one of said storage zone columns of marker receptacles, said playing zone having defined therein a plurality of marker receptacles arranged in an array of six columns and five rows, said six playing zone marker receptacle columns each being in line respectively with said six storage zone marker receptacle columns, said game board further having defined therein four board zones, each board zone located between said game zones, said game board yet further having a centrally located die-agitating device with one die therein having imprinted on five sides thereof a different number from one to five with one side of the die being blank;
a plurality of marker pieces for placement within said marker receptacles by each player of the game; and
said starting zone further having means for distinguishing same from said playing and storage zones.

4,131,282
BOARD GAME APPARATUS
Robin L. Boyer, 618 E. Calavar Rd., Phoenix, Ariz. 85022; Sonja E. Lazarus, 2133 W. Turney #89B, Phoenix, Ariz. 85015, and F. O. Buck, Jr., 6127 N. 13th St., Phoenix, Ariz. 85014
Filed Jun. 17, 1977, Ser. No. 807,374
Int. Cl.² A63F *3/00*
U.S. Cl. 273—271 **15 Claims**

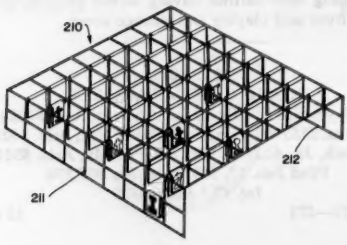


1. A game apparatus useable by at least a first and a second player comprising:
(a) a master matrix;
(b) first dividing means for dividing said master matrix into an array of n submatrices;
(c) second dividing means for dividing each of said n submatrices into n subdivisions;
(d) first identifying means attached to each said submatrix for identifying each said submatrix;
(e) second identifying means corresponding to said first identifying means and attached to each said subdivision for identifying each said subdivision within each said submatrix; and
(f) subdivision occupation identification means positionable within each said subdivision for identifying subdivisions previously occupied by the first player and subdivisions previously occupied by the second player.

4,131,283
GAME APPARATUS
Vaclav Havlik, 888 Foster City Blvd., Foster City, Calif. 94402
Division of Ser. No. 625,185, Oct. 23, 1975, Pat. No. 4,055,345.
This application Oct. 25, 1977, Ser. No. 845,327
Int. Cl.² A63F *3/02*
U.S. Cl. 273—282 **12 Claims**

1. Game apparatus comprising a game board including means mounting a plurality of playing fields in row and column array with at least every other one of the playing fields in each row and column of said array being associated with an opening extending all the way through said board; wherein said means mounting said plurality of playing fields comprises a mesh formed of mutually perpendicular elongated support members interconnected to provide a plurality of generally square openings therebetween and said plurality of playing fields comprises a plurality of squares dimensioned to be received within said openings with each of said plurality of squares being received within a different one of said square openings, said means mounting said plurality of playing fields also comprising means swingably attaching each of said squares along the same side thereof only to the adjacent one of a parallel set of support

members of said mesh and a plurality of game pieces each comprising a pair of indicia bearing bodies and means joining said pair of bodies to each other at one of their ends, said



joining means being of sufficient extent to enable each pair of bodies to be disposed in generally parallel relation on opposite sides of a square with the indicia on respective bodies being visible from opposite sides of the board.

4,131,284

DAMPER MEANS FOR DAMPING THE RESONANCE OF DISC RECORD TONE ARMS

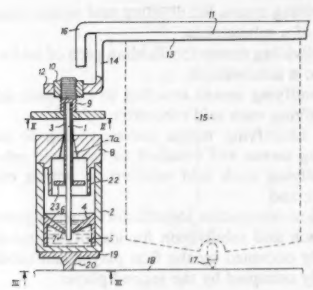
Alexander R. Rangabe, Stoneacre, Denmead, Portsmouth, England

Filed Feb. 20, 1976, Ser. No. 659,841

Claims priority, application United Kingdom, Feb. 28, 1975, 8476/75

Int. Cl.[2] G11B *3/30*

U.S. Cl. 274—23 R **27 Claims**



1. Damper means for damping the resonance of a disc record tone arm of the kind having a limb, adapted at one end for pivotal support in respective planes parallel with and normal to the plane of the record, and a cartridge including a stylus, said cartridge being mounted on the limb at a location remote from said end adapted for pivotal support, and being secured against vertical movement relatively to the limb, the damper means comprising:

a first element, secured relatively to the tone arm cartridge;

a second element in relatively movable engagement with said first element and extending toward the plane of the record in the operative position of the damper means;

energy absorbing means, comprising energy absorbing material, disposed between said first and second elements, for causing resistive force to be applied with respect to relative movement between said first and second element; and

skid means, connected to said second element for causing the damper means to come into direct mechanical contact with the record, when the damper means is in the operative position thereof, in such a manner that the damper means can slide transversely of the record trace without significant tracking of the record trace by the damper means,

whereby variation in tracking force is reduced as the stylus traverses warps in the record surface.

4,131,285

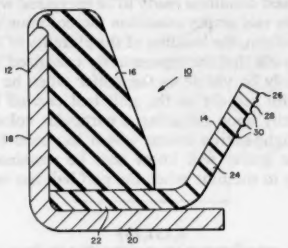
BONDED TFE LIP SEAL

Dennis N. Denton, Bessemer City, and David G. Boyd, Gastonia, both of N.C., assignors to Garlock Inc., Rochester, N.Y.

Division of Ser. No. 538,542, Jan. 6, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,431

Int. Cl.[2] F16J *15/32*

U.S. Cl. 277—1 **13 Claims**



1. A method for making a shaft seal of the type including a single annular metal case including a cylindrical portion and a radial flange and an annular flexible non-elastomeric sealing element having a radial portion in contact with said radial flange and also having a frusto-conical portion with a sealing lip on the distal end thereof comprising positioning an annular synthetic rubber filler ring in the annular space between said cylindrical portion of said metal case and said radial portion of said sealing element and being spaced away from and out of contact with said frusto-conical portion of said sealing element, and bonding said filler ring solely to both said cylindrical portion of said metal case and said radial portion of said sealing element, said positioning and bonding steps comprising molding said filler ring in place, and including the step of molding a plurality of hydrodynamic pumping elements on a shaft engaging surfce of said frusto-conical portion of said sealing element during said molding step.

4,131,286

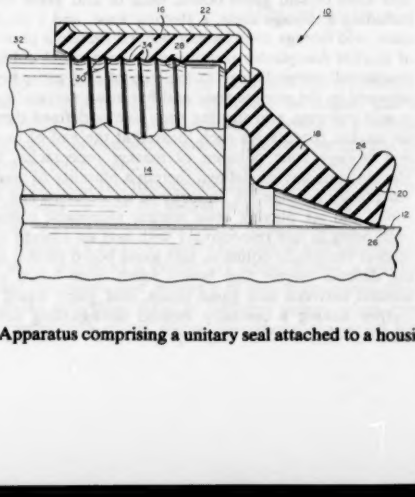
SEAL AND METHOD FOR ATTACHING SEAL

Dean R. Bainard, Bethel Township; York County, S.C., assignor to Garlock Inc., Rochester, N.Y.

Filed Jun. 30, 1976, Ser. No. 701,350

Int. Cl.[2] F16J *9/06*

U.S. Cl. 277—152 **3 Claims**



1. Apparatus comprising a unitary seal attached to a housing,

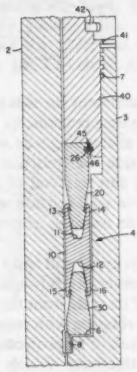
said seal including an integral mounting portion and sealing portion, said sealing portion including a sealing lip portion, both of said portions being made of elastomeric material and said mounting portion having at least one elastomeric, molded screw thread on a mounting surface thereof, said housing having at least one screw thread on a corresponding mounting surface thereof, said seal being attached to said housing by said screw-threaded surfaces being in screw threaded contact with each other, and said screw thread of said mounting portion having a different number of threads per inch than said screw thread of said housing, whereby the mis-match in the number of screw threads causes the screw thread on the mounting portion to cross-thread while still providing a good and satisfactory attachment.

4,131,287

ANNULAR SEAL

Richard H. Gunderson, and William T. Ilfrey, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Jul. 11, 1977, Ser. No. 814,080
Int. Cl.² F16J *15/08*
U.S. Cl. 277—191 **10 Claims**



1. A seal for sealing an annular volume existing between an outer cylindrical member having an inner sealing surface and an inner cylindrical member having an outer sealing surface comprising:

a sealing ring adapted to be positioned between the sealing surfaces of the cylindrical members, the sealing ring having a first set of two sealing lips projecting in one direction from the sealing ring defining a first channel where one of the sealing lips is capable of sealingly contacting the inner sealing surface of the outer cylindrical member, and the other sealing lip is capable of sealingly contacting the outer sealing surface of the inner cylindrical member, the sealing ring having a second set of two sealing lips projecting in the opposite direction as the first set of sealing lips from the sealing ring defining a second channel where one sealing lip of the second set of two sealing lips is capable of sealingly contacting the inner sealing surface of the outer cylindrical member and the other sealing lip of the second set of two sealing lips is capable of sealingly contacting the outer sealing surface of the inner cylindrical member;

a first setting ring at least partially disposed within the first channel and capable of contacting the sealing lips defining the first channel;

a second setting ring at least partially disposed within the second channel and capable of contacting the sealing lips defining the second channel, the surfaces of the setting rings and the sealing lips which contact each other when the setting rings are moved toward the sealing ring being adapted in a manner such that the sealing lips are spread into sealing contact with the sealing surfaces of the cylindrical members when the setting rings are moved toward the sealing ring; and

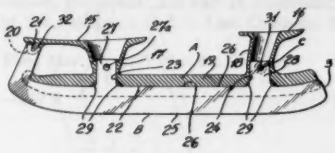
means for connecting the setting rings to the sealing ring.

4,131,288

SKATE WITH REPLACEABLE BLADE

Stephen G. Wilson, 592 Lemoyne Ave., Beloeil, Quebec, Canada

Filed Aug. 3, 1976, Ser. No. 711,201
Int. Cl.² A63C *1/30*
U.S. Cl. 280—11.17 **3 Claims**



1. A skate, comprising:

a frame having front and rear sole plates, front and rear pedestals extending, respectively, from said front and rear sole plates, and a tube-shaped section mounted on said pedestals, said sole plates, pedestals and tube-shaped section comprising a single, integral, die-cast unit;

a blade comprising an elongated body and having front, intermediate and rear tangs extending from one edge of said elongated body, the other edge of said elongated body comprising a sharpenable edge;

said tube-shaped section being provided with a groove for receiving said blade;

each pedestal having a slot extending inwardly from said groove to receive a respective tang of said blade;

said blade being held firmly in said groove with said intermediate tang in said slot of said front pedestal and said rear tang in said slot of said rear pedestal;

and means for removably retaining said blade in said frame, said means for removably retaining comprising:

locking pin holes extending transversely through said rear pedestal on either side of the receiving slot therein;

a registering opening in the rear tang of said blade;

a locking pin extending through the locking pin holes and the registering opening;

said locking pin having a head at one end thereof, the dimensions of said head being greater than the cross-sectional dimensions of said locking pin holes, said head seating on one of the outer surfaces of said rear pedestal;

said locking pin having a groove at the other end thereof for receiving a removable, resilient locking member;

said locking member, when in said groove, engaging a second outer surface of said rear pedestal to retain the pin in position.

4,131,289

SKI EQUIPMENT CARRIER

Karen Maller, 265-24 74th Ave., Glen Oaks, N.Y. 11004

Filed Aug. 24, 1976, Ser. No. 717,068
Int. Cl.² A63C *11/10*
U.S. Cl. 280—11.37 K **9 Claims**

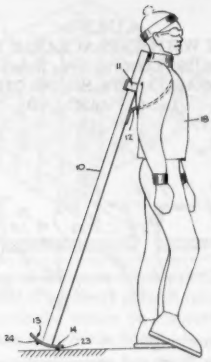
4. An apparatus for carrying ski equipment, comprising:

(a) a container member adapted to substantially fully accommodate ski equipment comprised of one or more skis and/or ski poles, said container member having inner and outer surfaces and being foldable into compact form when the ski equipment is removed therefrom;

(b) a base member integral with one end of said container member; and

(c) skid means affixed to said base member wherein said base member is bowed and wherein skid means comprises freely rotating ball-like rollers and a projection connected

to the base member such that the apparatus when containing the ski equipment can stand alone in a vertical position by resting on the rollers and the projection and such that when the apparatus is tilted forward to be transported by



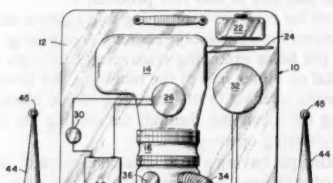
the skier the projection no longer engages the ground and the apparatus is permitted to be transported over a bare surface on the rollers and snow covered surfaces on the bottom surface of the base member.

4,131,290

SKI PROPULSION PACK

Joseph A. McMillan, P.O. Box 1331, Pagosa Springs, Colo. 81147

Filed Oct. 17, 1977, Ser. No. 842,479
Int. Cl.² A63C *11/00*
U.S. Cl. 280—11.37 R **9 Claims**



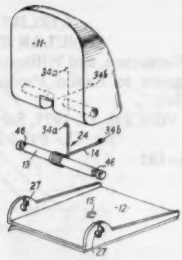
1. A muscle assisting device for aiding the arms of a user in making pulling motions, comprising:
(a) an air pump having an air intake;
(b) linearly expandable and contractable hose means having an end connected to said air intake and an opposite closed end;
(c) suction release means having a first position venting said air intake and hose means to the atmosphere and a second position sealing the air intake and hose means against entrance of outside air;
(d) switch means for selectively moving said suction release means between first and second positions;
(e) attaching means for engaging the closed end of said hose means with the arms of the user; and
(f) motor means connected to said pump for providing power thereto, the pump and motor means being carrier by the user.

4,131,291

TILTABLE AND REMOVABLE SKI ATTACHMENT

Dieter Thon, Munich, Fed. Rep. of Germany, assignor to Safety Jet Skisicherheitsbugel GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 8, 1976, Ser. No. 748,613
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1975, 2555514
Int. Cl.² A63C *11/00*
U.S. Cl. 280—11.37 E **9 Claims**



1. An anti-crossing attachment for skis comprising:
(i) a base plate having a base portion, for attachment to a ski, and spaced opposed upstanding side wall portions on said base portion, each side wall portion having therein an aperture including a slot one end of which opens at the upper edge of the side wall portion and the other end of which terminates in an opening of greater width than the slot,
(ii) a deflector having an upper end and a lower end and with an axle engaged transversely through the lower end and projecting at each of its ends from the deflector, said axle being locked against rotation with respect to the deflector, said axle having in each of its projecting ends a portion of reduced diametral thickness which is dimensioned to permit it to be passed, when the axle is in a first position of rotation, through the slot into the opening, but to be incapable of passing outwardly from the opening through the slot when the axle is in a second position of rotation 90° removed from said first position, said first position corresponding to the deflector being in a lowered condition with respect to the base plate and said second position corresponding to the deflector being in a raised condition with respect to the base plate,
(iii) disengageable resilient means to act between the base plate and the deflector to urge the deflector to raised condition,
(iv) stop means on the deflector to abut against the base plate and limit movement of the deflector in one direction to raised position.

4,131,292

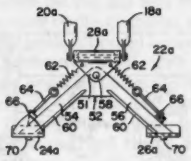
FRONT SKI ATTACHMENT FOR MOTOR BIKE

Melvin J. Swech, 1414 Garfield Ave., Brunswick, Ohio 44214

Filed Mar. 10, 1977, Ser. No. 776,124
Int. Cl.² B62M *27/02*
U.S. Cl. 280—14 **2 Claims**

1. A ski attachment for a motor bike or the like for use to replace a front wheel of the vehicle, which vehicle has a pair of parallel front support arms adapted to operatively position a wheel and its support sleeve at the lower end of said support arms, said attachment comprising a pivotably mounted support sleeve adapted to be positioned by and extend between the support arms replacing a wheel and its support sleeve, a pair of skis, and a reenforcing means secured to and extending be-

tween said support sleeve and said skis to form a unit therefrom, said support sleeve having a dependent flange thereon and said reenforcing means comprising an A-shaped metal frame fixedly secured at its base portions to said skis and secured to said support sleeve at said dependent flange; and



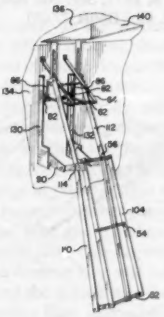
adjustable tension means connecting said skis to opposed edge portions of said flange, and said ski unit can pivot laterally of the bike.

4,131,293

RETRACTABLE SERVICE LADDER

John J. Kindle, Bettendorf, Iowa, assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 14, 1977, Ser. No. 842,446
Int. Cl.² B60R 3/02
U.S. Cl. 280—166 **12 Claims**



1. In a combine having an access platform integral with a combine body, a stowable access ladder comprising:

a ladder frame pivotally mounted to said combine body below said access platform, said ladder frame including a pair of hinge leaves having apertured ends, the hinge leaves being elongated brackets acting as spacing members locating said ladder away from said combine body, a pair of frame members one fixed at an upper end thereof to each hinge leaf, a pair of rung carriers, one fixed at an upper end thereof to each hinge leaf, a pair of spreaders each spaced between the lower ends of said frame members and said rung carriers, a plurality of rungs spaced between each of said rung carriers between the lower end and the upper end of said rung carriers;

a linkage member having an elongated longitudinal slot in a midsection thereof fixedly mounted in vertical alignment to said combine body below said access platform and above said pivotal mounting of said ladder frame;

a support strap having an integral upper support strap pin and an integral tab, the support strap pivotally attached at a lower end thereof to said ladder frame and having the pin slidably carried in said slot of said linkage member at an upper end thereof;

a spring grounded to said combine body at a point below the lower termination point of said elongated slot of said linkage member and attached to said tab of said support strap, whereby

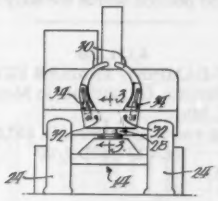
said spring is relatively relaxed when said ladder frame has been pivoted to a fully deployed position corresponding to said upper support strap pin being at the lower extreme of the slot of said linkage member and said spring is partially extended when said ladder frame is in a stowed position where said upper support strap pin is in the middle of said slot.

4,131,294

SKIDDING AND BUNCHING TRAILER

Robert G. Johnson, Rothschild, and Earl D. Drefcinski, Wausau, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Mar. 10, 1977, Ser. No. 776,138
Int. Cl.² B60P 7/12
U.S. Cl. 280—179 R **8 Claims**



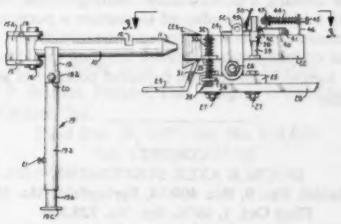
3. A trailer attachment for a tree harvester comprising a main frame including an elongated axle having ground engaging wheels at opposite ends thereof, a support frame carried by said main frame, a grapple frame pivoted about a generally horizontal axis on said support frame and having a generally flat upper support surface for supporting trees thereon, and biasing means pivoted at one end on said support frame through a first pivot and at an opposite end on said grapple frame through a second pivot, said first and second pivots being arranged so that said pivots and said horizontal pivot axis are located in a common inclined plane to position said upper support surface generally horizontal when trees are removed from said grapple frame.

4,131,295

QUICK CONNECT HITCH ASSEMBLY

Clarence Highberger, Highway 59 North, Garnett, Kans. 66032

Filed Sep. 19, 1977, Ser. No. 834,340
Int. Cl.² B60D 7/00
U.S. Cl. 280—475 **8 Claims**



1. A hitch assembly for coupling first and second vehicles for towing, said hitch assembly comprising:

a bar member adapted to be mounted on the first vehicle in substantially horizontal extension therefrom, said bar member having a notch defined therein;

a body member adapted to be mounted on the second vehicle, said body member having a substantially hollow interior and an open end for receiving said bar member;

at least one substantially straight guide post on said body member;

a sleeve received on said guide post for sliding movement axially thereon;

a latch element carried on said sleeve for movement therewith between a hitching position projecting into the interior of said body member at a location to register with said notch in a manner to retain said bar member hitched to said body member within the latter, and a release position displaced from said notch; and

resilient means for biasing said latch element to the hitching position,

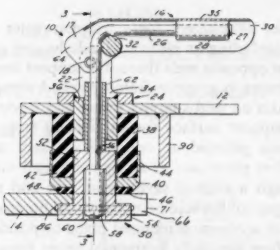
said bar member having a free end portion formed to engage a cooperating surface of said latch element in camming fashion to automatically displace the latter from its hitching position as the bar member is entering said body member, with said resilient means effecting automatic movement of said latch element to the hitching position in registration with said notch when the bar member reaches a fully inserted position within the body member.

4,131,296

SELF-DAMPING TRAILER HITCH

Don S. Strader, Marietta, Ga., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Jan. 9, 1978, Ser. No. 867,690
Int. Cl.² B60D *1/00*
U.S. Cl. 280—485 **12 Claims**



1. A trailer hitch for releasably coupling a draft vehicle to a drawn vehicle comprising a draw tongue adapted to extend from one of said draft and drawn vehicles; coupling means carried for bodily movement beneath said draw tongue; means for selectively bodily moving said coupling means upwardly and downwardly beneath said draw tongue; and a drawbar adapted to extend from the other of said vehicles including means defining a laterally opening slot adapted to receive said coupling means in a downward position of said coupling means and means defining a downwardly opening recess communicating with said slot and adapted to capture a portion of said coupling means as the latter is drawn upwardly by said moving means, said coupling means thereby coupling said drawbar to said draw tongue in an upward captured position of said coupling means.

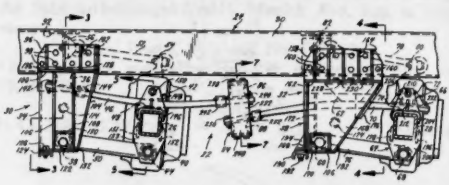
4,131,297

DOUBLE AXLE SUSPENSION

John E. Raidel, Rte. 9, Box 400-M, Springfield, Mo. 65804

Filed Oct. 1, 1976, Ser. No. 728,868
Int. Cl.² B60G *5/04*
U.S. Cl. 280—682 **25 Claims**

1. A vehicle suspension assembly for a vehicle having a chassis and front and rear axles comprising front and rear hanger assemblies depending from the vehicle chassis, a shackle assembly, a front leaf spring extending between the front hanger assembly and the shackle assembly, a rear leaf spring extending between the rear axle and the shackle assembly, means flexibly mounting the front spring to the front hanger assembly, means flexibly mounting the front and rear spring to the shackle assembly, all of said flexible mounting means permitting longitudinal deflection of the springs with respect to its associated mounting, the front leaf spring having a part between the front hanger assembly and the shackle assembly bearing downwardly against the front axle, a spring guide between the front axle and the part of the front leaf



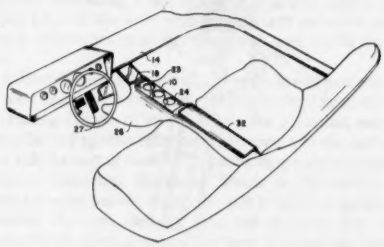
spring bearing thereon to permit relative longitudinal sliding movement between the front leaf spring and the front axle, and a load pad means supported by the rear hanger assembly, the rear leaf spring having an area between the rear axle and the shackle assembly bearing upwardly against the load pad means.

4,131,298

COMBINED ARM AND LEG REST FOR DRIVERS

Ulysee Douglas, 3203 W. Vernon Ave., Los Angeles, Calif. 90008

Filed Jun. 8, 1977, Ser. No. 804,717
Int. Cl.² B60R *27/00*
U.S. Cl. 280—727 **2 Claims**



1. A combined leg and arm rest device which is attachable in an automobile to the dashboard of the automobile comprising

a clamping member adaptable for fastening to a dashboard, said clamping member joined by a swivel joint to a plate member,

said plate member secured to an arm rest member and secured to a leg support member, with

said arm rest member extending from the plate member in a direction opposed from said clamping member, and

said leg supporting member extending, in the installed position, downwardly and towards the normal position of the leg of a driver of the vehicle.

4,131,299

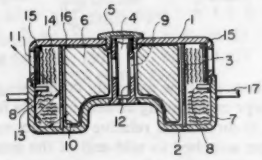
GAS GENERATOR FOR INFLATABLE VEHICLE COLLISION BAG

Koichi Ono; Toshiyuki Takahara, both of Tatsuno, and Tetsuyoshi Ito, Himeji, all of Japan, assignors to Daicel Ltd., Sakai, Japan

Filed Apr. 5, 1977, Ser. No. 784,880
Claims priority, application Japan, Apr. 5, 1976, 51-38041
Int. Cl.² B60R *21/08*
U.S. Cl. 280—736 **6 Claims**

1. A gas generator for an inflatable vehicle safety bag, comprising:

a) a cylindrical, skirted diffuser cap having a plurality of gas outlet openings spaced around its skirt,
b) a cylindrical, skirted base member having a central recess therein and engageable with the cup skirt to define therewith a generator housing,
c) a hollow cylindrical squib holder centrally and axially disposed between the cup and base member and having a plurality of spaced openings around its periphery,
d) a partition ring axially disposed between the cup and base member in a concentric manner with respect to the squib holder and the engaged skirts, to thereby define a first hollow cylindrical chamber between the ring and the holder and a second hollow cylindrical chamber between the skirts and the ring, and having a plurality of spaced openings in its lower periphery proximate the base member,
e) an annular diverter ring disposed on the inner periphery of the engaged skirts proximate the midpoint thereof and



extending inwardly in the second chamber toward the partition ring but terminating short thereof,
f) first and second laminar wire gauze bodies disposed in and substantially filling the second chamber below and above the diverter ring, respectively, said first and second laminar wire gauze bodies being disposed substantially perpendicular to one another and further being disposed with respect to the spaced openings in said diffuser cup and the spaced openings in said partition ring so that gas passing through said second chamber passes through said first and second laminar wire gauze bodies at oblique angles,
g) sintered metallic fiber ring disposed in the second chamber above the diverter ring and between the second wire gauze body and the openings in the diffuser cup skirt, said sintered metallic fiber comprising stainless steel fibers sintered to a sheet of stainless steel wire gauze,
h) an electric ignition squib disposed in the squib holder, and
i) a gas generating chemical agent disposed in the first chamber.

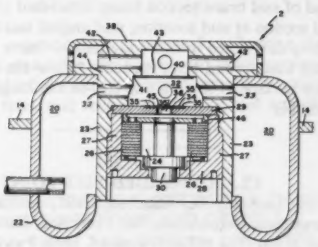
4,131,300

INFLATOR FOR AUTOMOBILE SAFETY DEVICE

Donald G. Radke, Rochester, and Donald J. Lewis, Troy, both of Mich., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Continuation of Ser. No. 376,866, Jul. 5, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,497
The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.
Int. Cl.[2] B60R *21/00*
U.S. Cl. 280—737 **3 Claims**

2. An apparatus for inflating at least one safety device, said apparatus comprising:
(a) a stored gas chamber adapted to be filled with a compressed gas;
(b) a gas generating chamber, adjacent to but separate from said stored gas chamber, said gas generating chamber being adapted to contain a combustible material, said combustible material being adapted to generate high pressure combustion gas in said gas generating chamber upon combustion, said gas generating chamber being adapted to contain an actuating means for igniting said combustible material, thereby causing combustion of said combustible material;
(c) a mixing chamber in communication with said stored gas chamber, in which mixing chamber said stored compressed gas and said generated combustion gas are mixed to form a hybrid gas adapted for inflating said safety device;
(d) a combustion gas barrier disposed between said mixing chamber and said gas generating chamber, said combustion gas barrier being adapted to prevent said stored compressed gas from entering said gas generating chamber from said mixing chamber prior to actuation of said combustible material, and being designed to rupture when the heat and pressure in said gas generating chamber exceed a predetermined temperature and pressure of said combustion gas barrier, whereby said combustion gas flows into said mixing chamber;
(e) an outlet means being disposed between and being adjacent to said mixing chamber and said safety device,



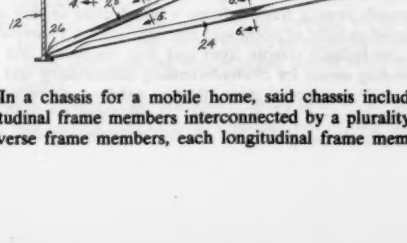
through which outlet means said hybrid gas passes from said mixing chamber to said safety device; and
(f) a hybrid gas barrier disposed between said mixing chamber and said outlet means to prevent said stored compressed gas from entering said outlet means from said mixing chamber prior to actuation of said combustible material, said hybrid gas barrier being adapted to rupture when the heat and pressure in said mixing chamber exceed a predetermined temperature and pressure, whereby said hybrid gas flows through said outlet means and into said safety device; and wherein:
(g) said combustion gas barrier has weak points disposed therein, said weak points being designed to rupture when the heat and pressure in said gas generating chamber exceed a predetermined temperature and pressure; and
(h) said combustion gas barrier ruptures only at said weak points and thereby produces small ports in said barrier, thereby increasing the velocity of said combustion gas passing through said ports.

4,131,301

CHASSIS FOR A MOBILE HOME

Michael F. Werner, Elkhart, Ind., assignor to Skyline Corporation, Elkhart, Ind.

Filed Jun. 29, 1977, Ser. No. 811,049
Int. Cl.[2] B62D *63/06*
U.S. Cl. 280—789 **7 Claims**



1. In a chassis for a mobile home, said chassis including longitudinal frame members interconnected by a plurality of transverse frame members, each longitudinal frame member

having an inner side and an outer side, the inner sides of said longitudinal frame members being oppositely positioned, outriggers projecting laterally from the outer side of each longitudinal frame member, the improvement wherein each outrigger is of a one piece strip construction comprising:

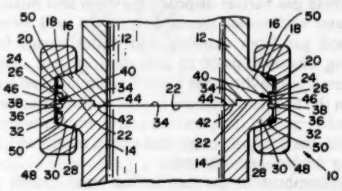
an upper horizontal section, a lower angled section, and a brace section; said horizontal section connected at one end to a said longitudinal frame member and having its other end spacedly located from said longitudinal frame memeber; said angled section connected at one end by a first bend to the other end of said horizontal section and extending downwardly thereform under said horizontal section;

said angled section terminating at its other end adjacent the longitudinal frame member; said brace section having one end connected by a second bend to the other end of said angled section and extending diagonally therefrom between said angled section and horizontal section, said brace section terminating at its other end at a location intermediate the ends of said horizontal section; the other end of said brace section being connected to said horizontal section at said location; said angled and brace sections being connected to said longitudinal frame member adjacent said second bend spacedly below the connection of said horizontal section one end to the longitudinal frame member.

4,131,302
CLAMP-WELDED PIPE JOINT

Byron H. Leonard, Jr., Atherton, Calif., assignor to Bechtel International Corporation, San Francisco, Calif.

Division of Ser. No. 695,605, Jun. 14, 1976, Pat. No. 4,065,846.
This application Sep. 1, 1977, Ser. No. 829,696
Int. Cl.[2] F16L *13/04*
U.S. Cl. 285—114 **2 Claims**

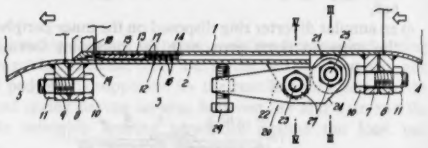


1. A pipe joint comprising: first and second pipe segments having male frustoconical skirts extending outwardly around the periphery of confronting portions of said pipe segments; said frustoconical skirts having mutually opposed machined and mated surfaces; said frustoconical skirts when mated defining angularly inclined sidewalls sloping from a broad cross section radially adjacent said pipe segments to a narrow cross section radially remote from said pipe segments; said skirts uniformly compressed towards each other such that said mated surfaces are in intimate contact; each of said skirts having an annular groove adjacent confronting portions of said periphery, thereby defining a mating ridge for receiving a seal weld; a seal weld sealably fusing said first and second pipe segments along said mating ridge defined by said uniformly compressed skirts; and a collet having a plurality of circumscribing segments extending around said skirts with a female frustoconical channel mating said male frustoconical skirts, said female frustoconical channel defining two opposed angularly inclined sidewalls sloping from defining a broad cross section of said channel radially adjacent said pipe segments to a narrow cross section radially remote from said pipe segments, said collet including means for circumferentially compressing said collet onto said juxtaposed skirts, thereby axially compressing said first and second pipe segments, for providing the mechanical strength of said pipe joint and for maintaining each of said skirts uniformly compressed with said seal weld extending across said ridge.

4,131,303
TELESCOPIC ASSEMBLY FOR PIPES FOR CONVEYING FLUIDIZED MATERIALS

Katsumi Nagasaki, Sakai; Koichi Tanimura, Suita; Yoshihiro Inoue, Nishinomiya; Hiroyuki Yamazaki, Amagasaki, and Tetsuo Momose, Hirakata, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Jul. 5, 1977, Ser. No. 812,683
Claims priority, application Japan, Jul. 8, 1976, 51-81554
Int. Cl.[2] F16L *27/12*
U.S. Cl. 285—302 **9 Claims**



1. A telescopic pipe assembly comprising an inner pipe and an outer pipe each having an end coaxially fitted one within the other for bi-directional relative axial movements,

a scraper attached to said end of the inner pipe and elastic means for urging the scraper into pressing contact with the inside peripheral surface of the outer pipe,

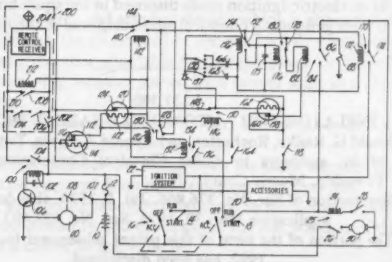
packing means mounted on the outer peripheral surface of the inner pipe inwardly of said end from said scraper for providing a minute clearance with the inside peripheral surface of the outer pipe, and

spacer means mounted on the outer pipe adjacent said end thereof, said spacer means including a plurality of rollers contacting the outer peripheral surface of the inner pipe for maintaining a uniform clearance between said pipes.

4,131,304
AUTOMATIC STARTER FOR VEHICLE

Richard J. Wagner, 125 North Dr., Wyandotte, Mich. 48192

Filed May 9, 1977, Ser. No. 795,288
Int. Cl.[2] F02N *11/08*
U.S. Cl. 290—38 C **18 Claims**



1. An automatic starting system for an internal combustion engine having a source of electrical power having one output connected to a common ground, an ignition system, a starting interlock, a throttle for controlling the speed of the engine and an electrically actuated starter motor for cranking the engine comprising:

means for generating an activation signal;

first timer means for generating a start energize signal for a first predetermined time after the initiation of said activation signal;

an interlock switch generating an interlock signal when the starting interlock is in its actuated position;

means for generating an engine-running signal indicative that the engine has started and is running under its own power;

a throttle solenoid for moving the throttle to a start position when energized;

start signal generator means energized in response to said start energize signal, said interlock signal and the absence of said engine-running signal for generating a first signal energizing said ignition system, a second signal energizing said throttle solenoid, and a third signal energizing the starter motor to crank the engine, said start signal means generating said third signal a predetermined time after said first and second signal, and further operative to terminate said second and third signals in response to said engine running signal; and

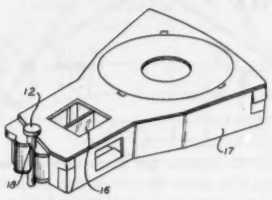
a second timer means for generating a termination signal de-energizing said start signal generator and terminating said first, second and third signals, a second predetermined time after the initiation of said start energize signal.

4,131,305

LEADER PIN

Ira Lopata, 35 Sutton Pl., New York, N.Y. 10022

Filed May 11, 1977, Ser. No. 796,027
Int. Cl.[2] B65H *75/28*
U.S. Cl. 242—74 **10 Claims**



1. A leader pin comprising:

(a) a rod,

(b) a knob on one end of the rod,

(c) a bifurcated section at the other end of the rod, defining a longitudinal slot for a strip to be inserted therebetween,

(d) one portion of the bifurcated section at the other end of the rod being longer than the other,

(e) a first fin on the longer portion of the bifurcated section extending across a plane defined by the slot, to restrain a strip in the slot against latitudinal movement in the slot,

(f) an elongated tube dimensioned to receive the rod,

(g) a longitudinal slit in the tube through which the strip in the slot may extend,

(h) the rod positioned in the tube,

(i) a second fin on the longer portion of the bifurcated section of the rod extending away from a plane defined by the slot in the rod, to restrain the rod from sliding out of the tube when they are engaged together.

4,131,306

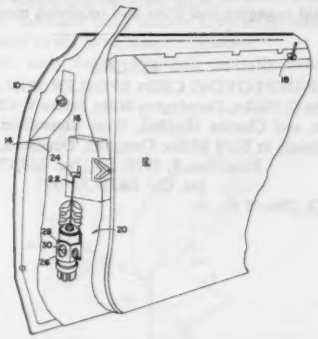
DOOR LOCK ACTUATOR WITH OVERRIDE MECHANISM

John Sokoly, Detroit, and Kenneth N. Roberts, Canton, both of Mich., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Jul. 14, 1977, Ser. No. 815,480
Int. Cl.[2] E05C *13/10*
U.S. Cl. 292—201 **2 Claims**

1. In a door locking apparatus including a locking mechanism movable between locked and unlocked positions, manually reversible power operated drive means connected to said locking mechanism for moving it between said locked and unlocked positions, non-yielding manual means connected to said lock mechanism for moving it between said locked and unlocked positions, said power operated drive means being caused to reverse whenever said manual means is used to lock or unlock said lock mechanism, the improvement which comprises:

bracket means for normally mounting said drive means in a fixed position relative to said locking mechanism, said



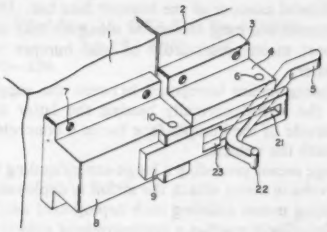
bracket means including means for allowing disengagement of said drive means and said bracket means whenever said drive means is jammed and said manual means is moved from said locked position to said unlocked position.

4,131,307

AUTOMATIC HOOKING SAFETY-HOOK FOR DOORS OF DWELLINGS AND OFFICES

Rita De Rossi, Via del Trullo 60, Rome, Italy (00100)

Filed Mar. 22, 1977, Ser. No. 779,962
Claims priority, application Italy, Mar. 31, 1976, 48805
Int. Cl.[2] E05C *17/24*
U.S. Cl. 292—268 **10 Claims**



1. An automatic hooking safety hook for securing a door pivotally mounted in a door frame and normally openable in an arc about a point lying substantially in the plane of the door frame, said safety hook comprising:

a rocking member having an engaging end and adapted for attachment to a door frame for pivotal movement in a plane substantially perpendicular to the plane of the door frame between a disengaging position, in which said engaging end is positioned adjacent the door frame, and an engaging position, in which said engaging end is pivoted away from the door frame;

an eyed member adapted for attachment to a door and including means for receiving said rocking member engaging end;

bias means for biasing said rocking member engaging end away from the door frame toward its engaging position to retain said engaging end engaged within said receiving means;

first actuating means operable from inside the door for pivoting said rocking member engaging end toward the door

frame to its disengaging position to permit release of said engaging end from said receiving means; and

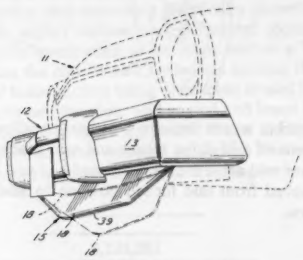
second actuating means operable from outside the door for pivoting said rocking member engaging end toward the door frame to its disengaging position to permit release of said engaging end from said receiving means.

4,131,308

SELF-DEPLOYING CHIN SPOILER FOR A VEHICLE

Thomas C. Holka, Farmington Hills; James V. Chabot, Birmingham, and Charles Haddad, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Jan. 9, 1978, Ser. No. 868,170
Int. Cl.² B62D *37/00*
U.S. Cl. 296—1 S **9 Claims**



1. A combination of a laterally extending bumper mounted on the front end of a vehicle and a self-deploying chin spoiler mounted beneath the bumper,

the vehicle bumper having an ornamental face bar and a reinforcing member concealed therebehind,

and the chin spoiler comprising a support means attached to said bumper reinforcing member,

an airfoil contoured along its leading edge to complement the frontal contour of the bumper face bar,

hinge means securing the airfoil along its rear edge to the support means rearwardly of said bumper reinforcing member,

and biasing means interposed between the support means and the airfoil normally biasing the latter toward the underside of the bumper face bar in a concealed position beneath the vehicle,

the hinge means providing a hinge axis extending laterally of the vehicle about which the airfoil is deployable,

the biasing means resisting such deployment until the speed of the vehicle reaches a predetermined velocity at which air pressure exerted upon the upper surface of the airfoil overcomes the biasing force of the biasing means.

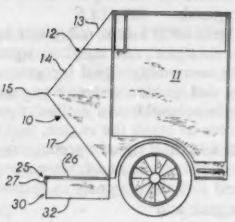
4,131,309

VEHICLE WIND DEFLECTOR

Lowell D. Henke, P.O. Box 1505, Conrad, Mont. 59425

Filed Sep. 23, 1977, Ser. No. 836,028
Int. Cl.² B62D *35/00*
U.S. Cl. 296—1 S **10 Claims**

1. A frontal assembly for attachment to a cab-over-engine type vehicle including a wind deflector extending from the front thereof and a bumper assembly located below said wind deflector extending beyond the leading edge of said wind deflector; said wind deflector including a plurality of substantially flat sections with a first section extending downwardly and forwardly from the vehicle body and diminishing in width from a width substantially the same as that of said vehicle body at a point adjacent the lower edge of the windshield of said vehicle to a reduced width at its most forward edge, a second section extending downwardly and rearwardly from said leading edge of said first section toward the bottom of said vehicle body, and side sections extending from the side edges of said first and second sections toward the sides of said vehicle body, said first section being positioned in a plane intersecting the top



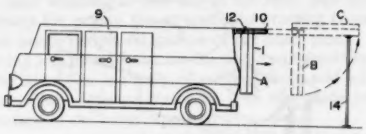
of said vehicle body and said second section being positioned in a plane intersecting the bottom of said vehicle body.

4,131,310

COMPACT CAMPING RIG

Keith W. Martinsen, 6745 Riverside Dr. E., Windsor, Ontario, Canada (N8S 1C1)

Filed Jul. 18, 1977, Ser. No. 816,725
Int. Cl.² B60P *3/34*
U.S. Cl. 296—23 R **2 Claims**



1. A folded self-contained camping rig which is attachable to the rear of a van or similar vehicle, in order to avoid wind drag, obstruction to sun roofs and air vents, and occupation of valuable room within said van, comprising in combination a rectangular central box with a partly enclosed bottom, having hingedly attached to each of two opposite sides thereof, a rectangular box-shaped wing, each of said wings having an open side opposite to the said hinged side, said wings being of the same length but half the width of the central box; the partly enclosed part of said central box being provided with a pair of doors to form an enclosed cupboard within the central box; a removable rectangular cover for the remaining open part of the central box, which is equipped with fold-away legs for the purpose of converting it into a table; extendable means for attaching said rig to the rear of said van and for supporting one end of said rig when unfolded for use; a pair of legs for supporting the free end of said rig when it is unfolded; and a tent of canvas or similar material which is attachable to the perimeter of the unfolded and erected rig, and to the rear of the van to which said rig is attached, and said tent being provided with flaps which cover the unfolded rig to form a roof for said tent, said tent being also divided into two equal but opposite sections for storing each section into each of said hinged wings.

4,131,311

COMBINED FOLDING TABLE AND SEAT ASSEMBLY

Edwin Nikitits, Lachine, and Jean G. Demers, Outremont, both of Canada, assignors to Franklyn M. Markus, Quebec, Canada

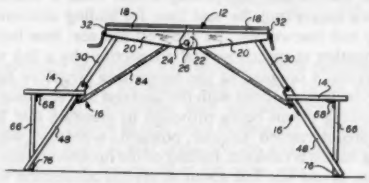
Continuation-in-part of Ser. No. 625,695, Oct. 24, 1975, Pat. No. 3,994,527. This application May 5, 1976, Ser. No. 683,327
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.
Int. Cl.² A47B *39/00*
U.S. Cl. 297—159 **34 Claims**

1. In a collapsible combined table and confronting seat of the

type wherein said seat and table are relatively pivotally movable between an open position wherein said table and seat are horizontal and the front edge of said seat is disposed adjacent and below one end of said table and a folded position wherein said seat is in substantially parallel relation with said table, an improved collapsible linkage for supporting said table and seat in said open position and for permitting said pivotal movement to said folded position, said linkage comprising:

a support member pivotally mounted at one end thereof to said table adjacent said one end of said table for movement between an open position in which said support member extends downwardly from said table and a closed position in which said support member is in confronting parallel relation with the bottom surface of said table;

a main leg, means for operatively pivotally mounting said main leg on said support member for movement relative to said support member between an open position in which said main leg and said support member are in substantially co-planar end-to-end relation and a closed position in which said main leg and support member are in confronting substantially parallel relation, whereby when said support member and said table are in their open position and said support member and said main leg are in their



open position, said main leg extends downwardly away from said table, and when said table, said support member and said main leg are in their respective closed positions, said main leg and said support member are in confronting parallel relation with the bottom of said table;

means for pivotally mounting said seat on said support member for relative pivotal movement between an open position in which said seat extends outwardly away from said support member and substantially parallel to said table and a closed position in which said seat is in parallel relation with said support member;

another leg member, said other leg member being pivotally mounted along one edge thereof on said seat adjacent the edge of said seat remote from said table for movement between an open position in which said other leg member extends downwardly from said seat toward the bottom of said main leg when said main leg is in its open position relative to said support member and a closed position in which said other leg is in substantially parallel relation with said seat; and

means for detachably connecting said other leg to said main leg when all the elements of said linkage are in their respective open positions.

4,131,312

OUTDOOR FURNITURE WITH REMOVABLE WEATHER COVER

Robert J. Price, 10 Steepletop Rd., Rowayton, Conn. 06853

Filed Mar. 18, 1977, Ser. No. 779,034
Int. Cl.[2] A47C *7/00*
U.S. Cl. 297—184 **12 Claims**

1. A weather protected outdoor chair or the like, which comprises

(a) a chair body having bottom, back and side wall panels,

(b) said panels forming an upwardly and forwardly facing body receiving recess,

(c) said panels and chair body being so constituted and assembled as to be relatively weatherproof to the wind-driven elements except as to the upwardly facing recess,

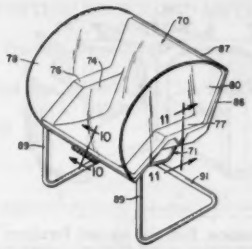
(d) a cover removably received on said chair body,

(e) said cover being structurally self-supporting and, when in covering position, serving to fully protect said recess from wind-driven elements,

(f) means for supporting the chair body,

(g) means on the chair body and/or supporting means for retaining said cover in an inactive position,

(h) said chair body having opposed, laterally outwardly



extending substantially continuous flanges, extending substantially uninterruptedly from the upper edge of the back panel to the forward edge of the front panel,

(i) intermediate portions of said substantially continuous flanges forming armests,

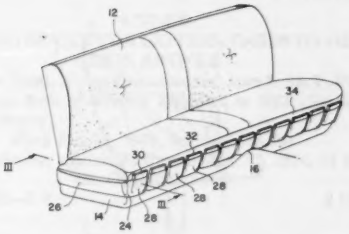
(j) said cover having first portions extending laterally outward over the upwardly facing surfaces of said substantially continuous flanges and second portions extending downwardly in regions laterally outward of said flanges.

4,131,313

REMOVABLE STORAGE COMPARTMENT FOR AUTO SEATS

James E. Jacobs, 903 Tabor Rd., Rte. 13, Box 171, Gadsden, Ala. 35901

Filed Nov. 14, 1977, Ser. No. 850,898
Int. Cl.[2] B60R *3/08*
U.S. Cl. 297—188 **5 Claims**



1. A removable storage compartment unit adapted to be detachably secured to a seat assembly of a vehicle about the side periphery of the seat portion of said seat assembly, comprising

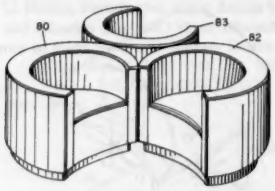
a band-like member formed of two bands of flexible material joined together along a common bottom edge, which edge is generally parallel to the longitudinal axis of said member, with said bands joined together at spaced distances to form a plurality of first pockets in the member, open to the top edge of the member, which top edge is opposed to said bottom edge, with an individual strap secured to each end of the member, said straps each fitted with means to detachably engage together, in which

the unit is of a length to fit entirely about the front, rear and opposed end sides of an automobile seat, when the straps are engaged together.

4,131,314
SEATING FURNITURE

Robert L. Knapp, Grand Rapids; Leif Blodee, Holland, and William R. Van Loo, Grand Rapids, all of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Division of Ser. No. 774,230, Mar. 4, 1977, abandoned. This application Nov. 9, 1977, Ser. No. 849,892
Int. Cl.[2] A47C *15/00*
U.S. Cl. 297—248 2 Claims

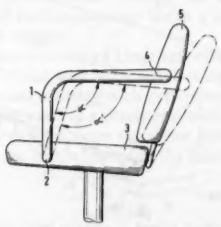


1. In combination, first and second furniture elements, each including a lower skirt of rigid sheet material formed to define a uniform curvature over a major portion thereof, said skirt being disposed such that its width extends vertically; a joinder member including a base adapted to rest on a floor and defining first and second elongated slots conforming to said uniform curvature of said skirts and adapted to receive the same in side-by-side relation; and means for locking said skirts into said slots, said locking means including a flanged element removable from said joinder member and extending above both skirts when said flanged element is secured to said joinder member and said skirts are received in said slots to hold said skirts in their respective slots by preventing said skirts from being withdrawn vertically from their associated slots.

4,131,315
CHAIR WITH DEFORMABLE ARMREST

Burkhard Vogtherr, Kandern, Fed. Rep. of Germany, assignor to Firma Drabert Sohne, Minden, Fed. Rep. of Germany

Filed Sep. 29, 1977, Ser. No. 837,793
Int. Cl.[2] A47C *3/00*
U.S. Cl. 297—286 3 Claims

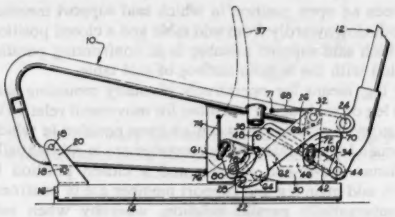


1. A chair or other article of furniture for sitting comprising:
a seat,
a reclinable backrest portion pivotally connected to said seat,
at least one armrest member being integrally formed of a generally horizontal portion pivotally secured to said backrest portion and a generally vertical portion pivotally secured to said seat, both said horizontal and vertical portions of said armrest member being substantially rigid, said armrest member having a further arcuate portion which joins said vertical and horizontal portions and is bendable to permit variation of the angle of inclination of said backrest portion relative to said seat by deformation of said arcuate portion while permitting said horizontal and vertical portions to remain essentially straight.

4,131,316
VEHICLE SEATS

Joseph Pallant, Albrighton, and John P. Johndrow, Wildwood, both of England, assignors to H. R. Turner (Willenhall) Limited, Walsall, England

Filed Jun. 24, 1977, Ser. No. 809,630
Claims priority, application United Kingdom, Jul. 2, 1976, 27562/76; Nov. 27, 1976, 49594/76
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—341 7 Claims



1. A vehicle seat comprising a seat base, a backrest and structure supporting the seat base for sliding movement forwardly and rearwardly, the backrest and seat base being coupled together at spaced pivotal connections by a link which is also pivotally coupled to the supporting structure below its said pivotal connections with the backrest and seat base, releasable locking means being provided to maintain said link in a fixed predetermined angular position, whereby, when said locking means is released, folding of the backrest relative to the seat base pivots said link about its pivotal connection with said supporting structure and thereby imparts sliding movement to the seat base, said vehicle seat including second releasable locking means for controlling the angular inclination or said backrest relative to the seat base, said second locking means comprising an elongate member mounted on the seat base, below the pivotal connections between the link and the seat base and backrest, for sliding displacement in its lengthwise direction and a locking element mounted on said seat base and operable to engage said elongate member and being connected to said backrest by coupling means which, when said locking element is inoperable, translates angular movement of the backrest about its pivotal connection with said link into said sliding displacement of the elongate member whereby the backrest can be pivoted to a desired angular setting and held at such setting by rendering said locking element operable.

4,131,317
MINING MACHINE HAVING ADVANCING MINE ROOF SUPPORTS

Will B. Jamison, Bethel Park, Pa., and Henry Fleck, Columbus, Ohio, assignors to Consolidation Coal Company, Pittsburgh, Pa.

Continuation of Ser. No. 623,493, Oct. 17, 1975, abandoned, which is a continuation of Ser. No. 457,459, Apr. 3, 1974, abandoned. This application Nov. 29, 1976, Ser. No. 745,965
Int. Cl.[2] E21C *25/06, 25/52, 29/22;* E21D *15/44*
U.S. Cl. 299—31 14 Claims

1. A mining machine comprising ,
a body portion having arm members pivotally secured thereto and extending forwardly therefrom, said arm members positioned in spaced parallel relation to each other,
a support frame rigidly secured transversely to the front end portion of said arm members,
an upper guide bar rigidly supported on said support frame and extending transversely relative to said body portion front end portion,
a lower guide bar rigidly supported on said support frame below said upper guide bar and positioned parallel thereto,

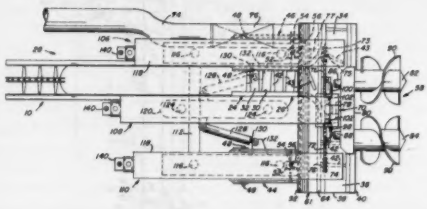
a carriage slidably mounted for transverse movement on said upper and lower guide bars and rotatably supporting a dislodging means,

a pair of sprocket members rotatably supported at the opposite end portions of said support frame,

a chain reeved about said sprocket members, said chain having end portions secured to said carriage,

drive means for rotating one of said sprockets to rotate said chain and move said carriage transversely of said body portion on said upper and lower guide bars,

means connected to the front end portion of said body portion for conveying dislodged material to the rear of said body portion,



first vertically adjustable roof support means positioned on said body portion for supporting the roof of the mine,

second vertically adjustable roof support means movably positioned relative to said body portion for supporting the roof of the mine as said body portion and said dislodging means advance forwardly in the mine, and

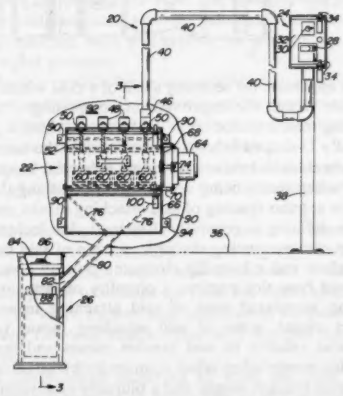
piston cylinder means for connecting said second roof support means to said body portion for permitting relative movement between said body portion and said second roof support means as said second roof support means supports the mine roof.

4,131,318

VACUUM COIN COLLECTION APPARATUS

Curtis Deem, c/o Sherman Industries, Inc., 600 W. Broad St., Palmyra, N.J. 08065

Filed Oct. 11, 1977, Ser. No. 841,077
Int. Cl.[2] B65G *51/02*
U.S. Cl. 302—2 R **15 Claims**



1. A coin collection apparatus comprising:

a collection chamber;

a plurality of inlets to said collection chamber;

each inlet being adapted to communicate with a separate and discrete source of coins;

vacuum means for applying a vaccum to said chamber and for pneumatically conveying coins through said inlets into said collection chamber;

blocking means for blocking each of said inlets;

moving means for moving said blocking means from said blocking position to an open position; and

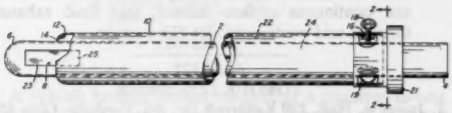
a vault communicating with said collection chamber for receiving coins from said collection chamber.

4,131,319

TRANSPORTING DEVICE AND METHOD OF TRANSPORTING

Daniel J. Klos, Franklin, Pa., assignor to Conair, Inc., Franklin, Pa.

Filed Jun. 26, 1975, Ser. No. 590,457
Int. Cl.[2] B65G *53/24, 53/42*
U.S. Cl. 302—58 **7 Claims**



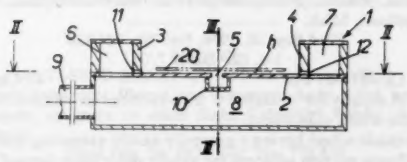
1. A device for use in transporting a particulate or pulverant material comprising a pair of radially spaced telescopic tubular members with the inner telescopic member thereof having a closed end with at least one axially extending passageway in the side thereof spaced axially from said closed end with one end of said passageway being adjacent to said closed end and with the outer telescopic member thereof having the end closest to said closed end in slidable engagement with the outer surface of said inner telescopic member, said pair of telescopic members being selectively axially locatable with respect to each other such that the extent of said passageway communicating therebetween is selectively variable and at least one of said tubular members having the end thereof remote from said passageway being adapted to be connected to means for providing a gaseous fluid flow through the space between said tubular members, said passageway and said inner telescopic member.

4,131,320

CONVEYOR DEVICE FOR LETTERS, CARDS OR OTHER THIN ARTICLE

Jean-Pierre Volat, Aix-en-Provence, and Jean-Louis E. Pichon, Marseilles, both of France, assignors to BERTIN & Cie, Plaisir, France

Filed Jun. 11, 1975, Ser. No. 585,883
Claims priority, application France, Jun. 11, 1974, 74 20107
Int. Cl.[2] B65G *51/02*
U.S. Cl. 302—2 R **2 Claims**



1. A generally trough-shaped topless track for conveying letters or like separate warpable thin articles of varying size and weight upon a supporting fluid layer, comprising:

two longitudinal strips extending in an even plane alongside each other and physically bottoming said track, said strips having respectively adjacent though transversely spaced inner sides which bound a longitudinally-extending continuous slot-like passage formed through the track bottom,

and remote outer sides which define the width of said track, each strip presenting between the inner and outer sides thereof a compact, smooth, and continuous surface designed for upholding adherence of fluid flow against said strip;

upright sidewalls projecting from said strips along said outer sides thereof to bound said track; and

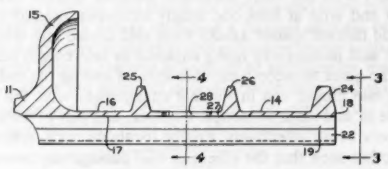
a multiplicity of nozzles comprising elongated slots having a lower side immediately at said surface and an upper side slightly above said surface located adjacent the foot of said sidewalls and distributed along said outer sides of said strips at a level therewith to open flush with the respective compact, smooth, and continuous surfaces thereof, said nozzles being oriented towards said slot-like passage with some inclination towards the direction of motion of the articles, and being designed, when fed with pressure fluid, to issue over each strip a sheet of motive fluid coating said strip with a fluid layer adhering to said compact, smooth, and continuous surface thereof, said fluid exhausting through said continuous slot-like passage.

4,131,321

TORQUE LUG DRIVE

J. James A. Hall, 220 Kenbrook Dr. #6, Vandalia, Ohio 45377

Filed Jul. 27, 1976, Ser. No. 709,235
Int. Cl.[2] B64C *25/42*
U.S. Cl. 301—6 A **4 Claims**



1. A torque lug mounting for an aircraft wheel half and disc-type brake assembly comprising a drum coaxial and integral with said wheel half, said wheel half having a rim with a flange, said drum extending axially away from said flange to an outer edge and having a thin lightweight wall with an outer surface and an inner surface, a thick annular reinforcing rib positioned on said outer surface at said outer edge and having a thickness measured axially of said drum which is substantially greater than the thickness of said wall measured radially of said drum and torque-transmitting lugs extending radially inward and axially across said inner surface at spaced-apart positions circumferentially of said drum for engagement with brake members of said assembly and for reinforcing said drum.

4,131,322

WHEEL TRIM RETENTION

Hans R. Beisch, Amherstburg, Canada, and Heinrich J. Hempelmann, Warren, Mich., assignors to Norris Industries, Inc., Ypsilanti, Mich.

Filed Sep. 20, 1976, Ser. No. 724,926
Int. Cl.[2] B60B *7/06*
U.S. Cl. 301—37 PB **43 Claims**

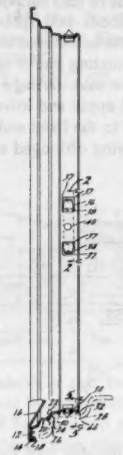
9. A means for retaining a trim member in position on a vehicle wheel comprising:

a vehicle wheel having a generally axially extending annular flange portion adjacent the axially outer edge thereof and an annular safety groove disposed immediately adjacent and axially inwardly of said annular flange portion;

a trim member installed on said vehicle wheel, said trim member comprising;

a retention band;

a plurality of primary retention members secured to a radially outer surface of said retention band and having portions bitingly engaging said annular flange portion of said wheel at circumferentially spaced locations thereof; and

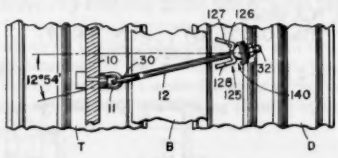
secondary retention means integrally formed on said retention band, said secondary retention means engaging said safety groove of said wheel in response to distortion of said retention band caused by said engagement of said

primary retention members and said annular flange portion of said wheel at circumferentially spaced locations thereof, said safety groove engagement locations being circumferentially disposed between said annular flange engagement locations.

4,131,323

DUAL WHEEL ASSEMBLY FOR TRACTORS

William J. Dietrich, Sr., Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Continuation-in-part of Ser. No. 655,132, Feb. 4, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,704
Int. Cl.[2] B60B *11/00*
U.S. Cl. 301—36 R **5 Claims**



1. In apparatus for securing a rim of a dual wheel to a rim of a tractor wheel, the improvement comprising: a plurality of attaching means spaced about said tractor wheel; a plurality of generally U-shaped bracket means fixed to the interior of said dual wheel, each bracket providing a curved bearing surface, said bracket means being spaced at different angular intervals than the angular spacing of said attaching means, each bracket further defining a generally T-shaped slot including a base portion communicating through an edge of said curved bearing surface and a laterally elongated portion communicating with said base slot portion; a plurality of fastener means for securing associated ones of said attaching means and said bracket means, some of said attaching means being offset clockwise relative to said bracket means and some of said attaching means being offset counterclockwise relative to their associated bracket means; and a plurality of adjustment means, one for each fastener means, each adjustment means including a first adjusting member having a bearing surface curved to permit adjustment to achieve offset alignment, said curved surface of said first adjusting member engaging said curved bearing surface of an associated bracket means, a second adjusting member having a curved surface for permitting adjustment of said fastener in a radial direction of said tractor wheel,

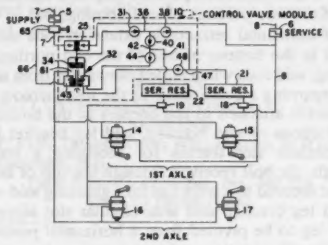
said curved surfaces of said first and second adjusting members facing opposite directions.

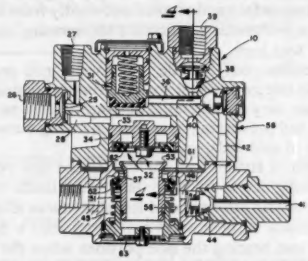
4,131,324

TRACTOR-TRAILER AIR BRAKE SYSTEM WITH TRAILER MULTI-FUNCTIONAL EMERGENCY CONTROL VALVE FIXTURE

Sham L. Kurichh, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 30, 1977, Ser. No. 856,119
Int. Cl.² B60T *13/00*
U.S. Cl. 303—7 **4 Claims**





1. A trailer air brake system in combination with a tractor air supply line and a tractor air control line comprising;

a pair of spring-set brake actuators for each set of wheels;

each said actuator having a spring chamber and a service chamber;

a service relay valve for each reservoir connected therewith and the service chambers of said actuators for each said set of wheels for passing air from the corresponding reservoirs to said associated service chambers, said relay valve being connected with said tractor air control line to receive signal pressure;

a control valve module for receiving air under pressure from said lines and distributing the air to said reservoirs and said spring chambers, said module comprising a housing and valve elements supported therein defining;

a two-way check valve connecting with said lines and constructed for forwarding air from the line having the higher pressure;

a relay valve having an inlet chamber, an outlet chamber, a cylinder and piston located for receiving signal air from said two-way check valve and mechanism interacting with said piston to exhaust air from the outlet chamber;

a first check valve located and constructed for passing air from said two-way check valve at a selected minimum pressure;

a second check valve receiving air from said first check valve and discharging air into a first of said reservoirs;

a third check valve receiving air from said first check valve and discharging air into a second of said reservoirs;

a fourth check valve receiving air from said third check valve and from said second reservoir and discharging air into said relay valve inlet portion;

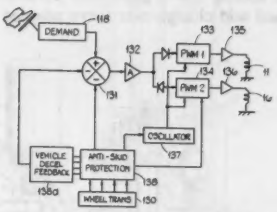
said outlet portion of said relay valve being connected to said spring chambers.

4,131,325

ELECTRICALLY CONTROLLED FLUID BRAKE SYSTEM

John P. Bayliss, Redditch, England, assignor to Girling Limited, Birmingham, England

Continuation of Ser. No. 642,382, Dec. 19, 1975, abandoned. This application Aug. 12, 1977, Ser. No. 824,107
Claims priority, application United Kingdom, Jan. 2, 1975, 157/75
Int. Cl.² B60T *8/00*
U.S. Cl. 303—93 **3 Claims**



1. A vehicle braking system comprising a chamber having means therein movable by fluid pressure to apply at least one wheel brake; an electrically operable inlet valve and an electrically operable outlet valve for controlling the flow of fluid into and out of said chamber respectively; and an electrical circuit for controlling said valves, said circuit having a first variable signal input means responsive to driver operation of said braking system, a second variable signal input means responsive to the degree of brake application achieved by the fluid pressure, error signal generating means connected to said first variable input means and to said second variable input means for producing an error signal of polarity and magnitude corresponding to the difference between the signals received from said first variable input means and said second variable input means, and means for generating a pulse train of selected frequency including a pair of pulse width modulation devices each having an input from said error signal generating means, one of said pulse width modulating means having an output connected to said outlet valve, the other of said pulse width modulation means having an output connected to the inlet valve, and means responsive to the polarity of the error signal for determining which one of the pulse width modulation means is operated, said pulse width modulation means acting on said pulse train to produce a mark-space ratio determined by the magnitude of the error signal, whereby the degree of brake application may be varied to bring the error signal to substantially zero and excessive wheel deceleration detection means is connected to the pulse width modulation means associated with said outlet valve and is adapted to apply a continuous signal to said outlet valve to open the same when wheel deceleration greater than said predetermined valve is detected and is also connected to said error signal generating means to override the signal thereto from said variable input means.

4,131,326

ANTI-SKID BRAKE CONTROL APPARATUS

Katsuki Takayama, Chiryu, and Masamoto Ando, Aichi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Feb. 24, 1977, Ser. No. 771,570
Claims priority, application Japan, Mar. 19, 1976, 51-30200; Mar. 23, 1976, 51-32331; Mar. 23, 1976, 51-32332
Int. Cl.² B60T *8/14*
U.S. Cl. 303—115 **6 Claims**

1. An anti-skid brake control apparatus for a vehicle including a fluid pressure cut-off valve for opening or closing a fluid pressure conduit between a master cylinder and wheel cylinders in response to a skid sensing signal, comprising:

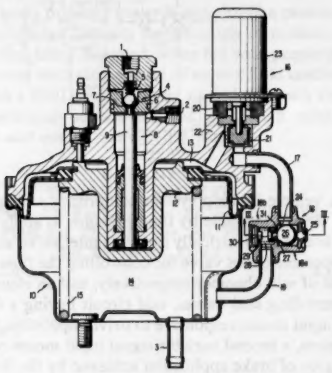
a plunger adjacent said cut-off valve for reducing or increasing said wheel cylinders pressure by controlling the ca-

pacity of said fluid pressure conduit between said cut-off valve and said wheel cylinders,

a servo-device adjacent said plunger having first and second chambers divided by a servo-piston, said servo-piston being adapted for moving said plunger by means of operational fluid pressure,

a change-over valve interconnecting said first and second chambers for admitting or draining said operational fluid to or from one of said first and second chambers in response to said skid sensing signal,

a pressure sensing valve positioned between said servo-device and said change-over valve adapted to be closed



when the pressure difference between said first and second chambers reaches a predetermined value during a pressure re-applying stage after decreasing said wheel cylinders pressure and

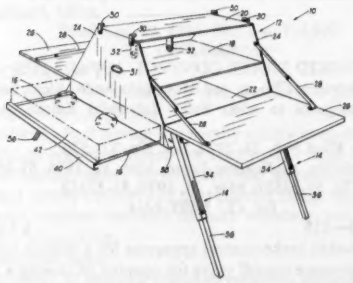
an acceleration responsive valve connected by a passage member with said sensing valve so as to be opened when said vehicle is decelerated above a predetermined value including a ball disposed within a connecting chamber, and a by-pass passage interconnecting said pressure sensing valve and said acceleration responsive valve connecting chamber, said pressure sensing valve and said acceleration responsive valve being arranged in a series within a fluid pressure passage.

4,131,327

PORTABLE PICNIC AND CAMPING CABINET TABLE

Esther L. Marshall, and William B. Allen, both of 7031 E. Orme, Wichita, Kans. 67207

Filed Dec. 2, 1977, Ser. No. 857,031
Int. Cl.[2] A47F *5/08*
U.S. Cl. 312—241 **4 Claims**



1. A portable picnic and camping cabinet table for storing picnic and camping supplies therein and converting into an outdoor kitchen when set up, the cabinet table comprising:

a cabinet housing having a horizontal shelf therein for storing the supplies, said cabinet housing including a top portion, a bottom portion, end portions, and foldable side portions, the foldable side portions hingeably attached to the bottom of said housing and forming a table surface when folded outwardly and lowered into a horizontal position;

four telescoping legs pivotally mounted at the corners of the bottom of the side portions of said housing, said legs when raised into a horizontal position disposed against the bottom of the side portions of said housing; and

a pair of horizontal retractable extension rods slidably received in the bottom of one of the end portions of said housing, said rods when pulled outwardly from said housing supporting a camp stove or the like thereon;

a leg bracket attached to the corners at the bottom of the side portions of said housing, said leg bracket having a semi-circular slot therein for receiving a bolt therethrough, the bolt received through the top of said upper leg and secured to a wing nut for tightening said upper leg to said leg bracket, said semi-circular slot allowing said upper leg to be pivoted from a horizontal position adjacent the side portions of said housing downwardly at various angles from the vertical depending on the level of the ground surface and pivoted outwardly from said housing into a horizontal position for transporting the cabinet table by said legs;

said retractable rods include a tansverse rod support attached to one end of said rods for rigidly supporring siad rods when they are extended outwardly from said cabinet housing and preventing objects from falling outwardly off the ends of said rods; and

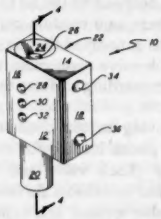
foldable braces attached at one end to the side portions of said housing and at the other end to the inside of the end portions of said housing, said foldable braces allowing the side portions to be folded outwardly into a horizontal position and bracing the side portions when the side portions are used as a table.

4,131,328

ELECTRICAL CONNECTOR FOR SEQUENTIAL CONNECTION AND DISCONNECTION OF CIRCUITS

Frank M. Minar, Long Branch, and Peter A. Abitante, Westfield, both of N.J., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Oct. 25, 1977, Ser. No. 845,278
Int. Cl.[2] H01R *3/06*
U.S. Cl. 339—14 R **17 Claims**



1. A connector assembly for providing sequential connection and disconnection of electrical circuits coupled thereto comprising, in combination:

a support body with a plurality of substantially identical male connector members each extending from said support body a uniform distance;

a connector body with plurality of substantially identical apertures therein, each aperture being positioned and of a size sufficiently large to receive each said male connector

member on said support body when said support body and said connector body are urged toward each other, said connector body has a plurality of detent openings disposed along each said aperture;

each said aperture in said connector body having a female connector barrel disposed therein, each said barrel being disposed in an aperture so that it is capable of electrically contacting the male connector member received in the aperture housing said barrel, when said support body is urged toward the said second connector body; and

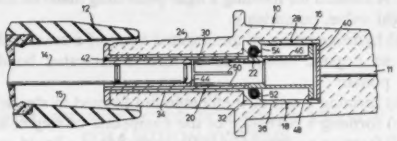
means to selectively locate each said barrel member at a desired position within the aperture housing each said barrel member.

4,131,329

CURRENT INTERCHANGE FOR A GAS ACTUATED BUSHING

Richard P. Flatt, Oconomowoc, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Nov. 10, 1976, Ser. No. 740,376
Int. Cl.[2] H01R *13/52*
U.S. Cl. 339—111 **16 Claims**



1. An electrical connection comprising: a housing,

an electrically conductive member extending through said housing,

means for supporting said member in a fixed position in said housing,

a bore contact mounted in said housing for reciprocal movement relative to said conductive member,

and current interchange means electrically connected to and mounted on said conductive member in a position to encircle said bore contact and having an inside diameter smaller than the diameter of said bore contact for maintaining electrical communication between the outside surface of said bore contact and said conductive member.

4,131,330

MOUNTING DEVICE FOR ELECTRICAL CONNECTORS

Lawrence J. Stupay, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 672,430, Mar. 31, 1976, abandoned.
This application Jun. 27, 1977, Ser. No. 810,482
Int. Cl.[2] H01R *9/00*; H02B *1/02*
U.S. Cl. 339—125 R **10 Claims**

1. A one-piece molded device comprising:

a mounting platform, said mounting platform including a front side,

a rear side, and integrally formed upper and lower sections, said upper section comprising

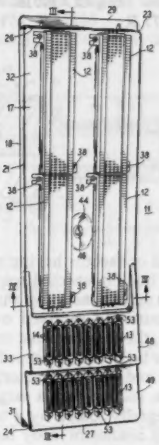
means for supporting a first plurality of longitudinally elongate electrical connectors of a first type, and

means defining a passageway on said front side at the rear of the supported first plurality of connectors, said passageway being closed along the longitudinal, rear and upper transverse sides thereof for providing a protective housing for wiring to the first connectors and for protecting the wiring from abrasion from and contact with a building wall, the lower transverse side of said passageway being open communicating said passageway on said front side with said lower section on said rear side to permit the wiring to extend to the rear side of said lower section; and

said lower section comprising

connector mounting means including slots adapted to receive and house electrical connectors of a second type, and

means for supporting the second plurality of electrical connectors in association with said slots,



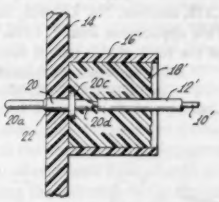
whereby the rear building wall side of said lower section is exposed to permit wirin xtending from said passageway to be engaged with contacts on the rear side of the second plurality of electrical connectors.

4,131,331

WATERPROOF ELECTRICAL CONNECTOR

Giles A. Kendall, Jr., Glendora, Calif., assignor to Clemar Mfg. Corp., Azusa, Calif.

Filed Nov. 18, 1977, Ser. No. 852,852
Int. Cl.[2] H01R *3/02*; H05K *5/06*
U.S. Cl. 339—126 RS **6 Claims**



1. A waterproof electrical connector assembly comprising:

a portion of a wall of a housing through which electrical connection is to be made, said wall portion being of a plastic material;

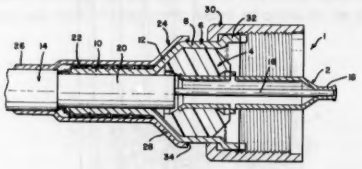
an opening in said wall portion through which electrical connection is to be made; and

a conductive insert dimensioned to be fitted in said opening by sufficient force to exceed the compressive yield strength of the plastic material and to induce cold flow of the material into surface imperfections of said insert, thereby forming a substantially perfect watertight seal.

4,131,332
RF SHIELDED BLANK FOR COAXIAL CONNECTOR

Richard S. Hogendobler, Camp Hill, and Robert M. Murray, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 758,731, Jan. 12, 1977, Pat. No. 4,070,751.
This application Aug. 23, 1977, Ser. No. 827,193
Int. Cl.[2] H01R *17/04*
U.S. Cl. 339—177 R 2 Claims



1. In a coaxial connector having a center contact, a sleeve form connector body connected respectively to a center conductor and to an outer conductive sheath of a coaxial cable and a ferrule concentrically received over said sheath and said connector body, the improvement comprising:

said connector body being stamped and formed from a single metal blank and being characterized by a smaller diameter sleeve form section and a larger diameter sleeve form section integrally joined by a transition of frustoconical section, said connector body having a longitudinal seam entirely the length thereof and at least one additional slit in said frustoconical transition,

said ferrule being unitary and seamless and radially crimpable,

said unitary ferrule at least partially covering said larger diameter sleeve form section,

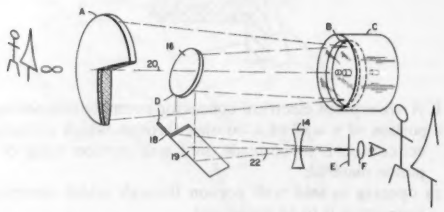
said unitary ferrule being radially crimped over said cable sheath and said smaller diameter sleeve form section, and

said unitary ferrule intimately encircling and engaging said frustoconical section, thereby spanning across each said slit and spanning across a portion of said seam which runs through said frustoconical section to eliminate signal attenuation and shielding leakage.

4,131,333
OPTICAL STABILIZER HAVING SPACE REFERENCED MOTION

William E. Humphrey, Oakland, Calif., assignor to Optical Research and Development Corporation, Pleasant Hill, Calif.

Division of Ser. No. 298,050, Oct. 16, 1972, Pat. No. 3,964,817, which is a continuation-in-part of Ser. No. 75,965, Sep. 28, 1970, Pat. No. 3,711,178, and Ser. No. 215,485, Jan. 5, 1972, Pat. No. 3,761,157. This application Jun. 7, 1976, Ser. No. 693,617
The portion of the term of this patent subsequent to Jan. 16, 1990, has been disclaimed.
Int. Cl.[2] G02B *23/02*
U.S. Cl. 350—16 4 Claims



1. An optical instrument for stabilizing an image upon being subjected to angular vibrational orientation, said optical instrument comprising: an optical path for receiving light from an object and transmitting light to an imaging plane; a fluid filled chamber within said optic path including first and second windows for permitting the entrance and exit of light from said chamber; optically transmittive means disposed within the optic path interior of said fluid filled chamber for receiving incident rays from said object and transmitting rays to said imaging plane; means for maintaining said optically transmittive means within said optic path interior of said fluid chamber; means for biasing said optically transmittive means to a neutral position; and means in combination with at least one of said windows for generating an optical wedge proportionate to the relative angular displacement between said optically transmittive means and said window.

4,131,334
LIGHT POLARIZING MATERIALS, SUSPENSIONS THEREOF, AND PROCESS FOR MANUFACTURING SUCH SUSPENSIONS

Michael Witte, Chatham, N.J.; Robert L. Saxe, New York, and Robert I. Thompson, Plainview, both of N.Y., assignors to Research Frontiers Incorporated, Plainview, N.Y.

Filed May 11, 1977, Ser. No. 795,820
Int. Cl.[2] G02B *5/30;* G02F *1/01*
U.S. Cl. 350—147 19 Claims

1. A method for forming a light-polarizing material for use in a light valve, comprising:

(a) hydrogenating an unsaturated bond of a branch chain of an organic compound to form a saturated bond compound;

(b) forming a salt of the compound formed in step a;

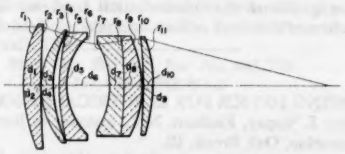
(c) forming a perhalide of the compound of step b; and

(d) forming a suspension of the perhalide in a liquid, wherein the suspension is light polarizing.

4,131,335
PHOTOGRAPHIC LENS SYSTEM

Tadashi Kimura, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,090
Claims priority, application Japan, Mar. 23, 1976, 51-31832; Mar. 4, 1977, 52-23499
Int. Cl.[2] G02B *9/60*
U.S. Cl. 350—218 16 Claims



1. A photographic lens system comprising a first, second, third, fourth and fifth lens components, said first lens component being a positive lens with its convex surface postioned toward the object side, said second lens component being a positive meniscus lens with its convex surface positioned toward the object side, said third lens components being a negative meniscus lens with its convex surface positioned toward the object side, said fourth lens component being a negative cemented meniscus doublet with its concave surface positioned toward the object side, said fifth lens component being a positive lens, said photographing lens system satisfying the following conditions:

$$0.51f < \sum_{i=1}^{10} d_i < 0.58f \quad (1)$$

$$0.14f < \sum_{i=1}^{5} d_i < 0.2f \quad (2)$$

(3) $0.5f < f_{12} < 0.6f$

(4) $-10.7 < r_8 < -0.6$

(5) $0.04 < n_5 - n_4 < 0.13$

wherein reference symbol

$$\sum_{i=1}^{10}$$

d_l represents the overall length of the lens system, reference symbol

$$\sum_{i=1}^{5}$$

d_l represents the length from the surface on the object side of the first lens component to the surface on the image side of the third lens component, reference symbol f_{12} represents the total focal length of the first and second lens components, reference symbol r_8 represents the radius of curvature of the cemented surface of the fourth lens component, reference symbols n_4 and n_5 respectively represent refractive indices of respective lenses constituting the fourth lens component, and reference symbol f represents the focal length of the lens system as a whole.

4,131,336

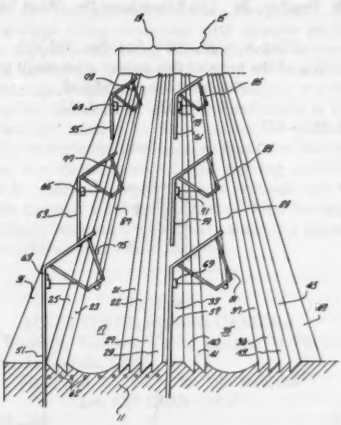
PRIMARY REFLECTOR FOR SOLAR ENERGY COLLECTION SYSTEMS

Robert A. Frosch, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles G. Miller, Pasadena, and James B. Stephens, La Crescenta, both of Calif.

Division of Ser. No. 762,363, Jan. 25, 1977, which is a division of Ser. No. 598,969, Jul. 24, 1975, Pat. No. 4,065,053. This application May 15, 1978, Ser. No. 906,297

Int. Cl.² G02B *5/10*

U.S. Cl. 350—292 **8 Claims**



1. A large primary solar reflector for use with a solar energy collection system, comprising:

a porous supporting structure having a linear sawtooth-like profile;

pipes having small orifices therein embedded in said supporting structure; and

a reflective material overlaying said supporting structure and being held to the surface thereof by a negative pressure at the surface created by drawing a vacuum on said pipes.

4,131,337

COMPARISON READER FOR HOLOGRAPHIC IDENTIFICATION CARDS

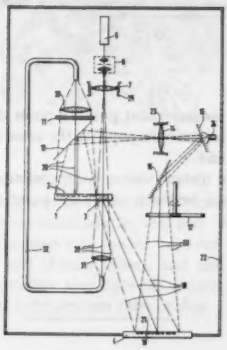
Roland Moraw, and Günther Schädlich, both of Naurod, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 16, 1977, Ser. No. 769,345

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1976, 2606348; Oct. 25, 1976, 2648180

Int. Cl.² G03H *1/22;* G06K *9/08*

U.S. Cl. 350—3.86 **19 Claims**



1. A device for verifying an identification element having visible indicia thereon and on an adjacent portion thereof having a transmission hologram of said visible indicia as originally placed on the identification element, said device comprising:

(a) means for illumination of both said hologram and said visible indicia from the same side of said identification element;

(b) means, including a generally planar surface, for displaying an optically produced image on said surface;

(c) means, associated with said image displaying means, for producing an optical image of the visible indicia on the identification element;

(d) means associated with said image displaying means, for producing a reconstructed image of the hologram on the identification element;

(e) means for projecting said optical image and said reconstructed holographic image, in superimposed register, upon said planar surface;

wherein said optical image producing means and said reconstructed holographic image producing means comprise a laser as a common source of radiation for each; and

wherein said optical image projecting means comprises means including a beam attenuator for optically directing a beam from said laser which has passed through said hologram as a laser light of zero order diffraction upon the visible indicia on the identification element and for adjusting the intensity of said laser light of zero order of diffraction for equalizing the intensity of the optical image to the intensity of the laser radiation of the first order of diffraction forming the reconstructed holographic image on said planar surface.

4,131,338

MEASUREMENT OF INTERPUPILLARY DISTANCE

Henry M. Zalewski, 194 Washington Ave., Carteret, N.J. 07008

Filed May 24, 1977, Ser. No. 799,954

Int. Cl.² A61B *3/10, 3/04, 3/00;* G02C *11/02*

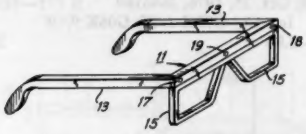
U.S. Cl. 351—5 **2 Claims**

1. A method of measuring distant vision interpupillary distance, comprising in combination the steps of:

fixing the patient's vision on a first indicium located adjacent one of the user's temples,

establishing, as a zero point, a point directly before the center of the patient's pupil on the same side as said first indicium,

fixing the patient's vision on a second indicium located adjacent the other of said user's temples,



noting, as a measurement point, a point directly before the center of the patient's pupil on the same side as said second indicium, and

taking, as the distant vision interpupillary distance, the lateral distance between said zero point and said measurement point.

4,131,339

POWER DIODE

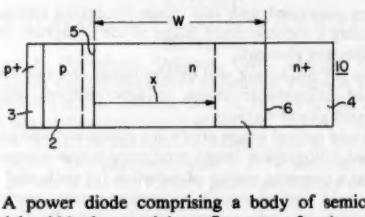
Friedrich Dannhäuser, and Alfred Porst, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 15, 1977, Ser. No. 768,940

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1976, 2608432

Int. Cl.² H01L *29/90*

U.S. Cl. 357—13 **4 Claims**



1. A power diode comprising a body of semiconductor material, said body containing a first zone of a given thickness and a given specific resistance and having a first-type conductivity, an outer zone adjacent to one of two opposed major surfaces of said first zone, said outer zone being of the same semiconductor material as said first zone, having a lower specific resistance than said first zone and having a second-type conductivity, a p-n junction only between said first zone and said outer zone, another outer zone adjacent to the other opposed major surface of said first zone, said another zone being of the same semiconductor material as said first zone, said another outer zone having said first-type conductivity, and being doped to a higher concentration than said first zone, ohmic electrical contact being made to only said outer zone and said another outer zone, the specific resistance and thickness of the first zone being so adapted to each other the $U_B < U_{pT}$, wherein U_B is the avalanche voltage and U_{pT} is the potential at which the space charge zone includes the entire first zone.

4,131,340

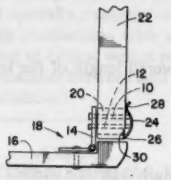
ADJUSTABLE EYEGLASS TEMPLE

Sidney Preston, 410 Parkside Ct., Copiague, N.Y. 11726

Filed Jan. 10, 1977, Ser. No. 757,905

Int. Cl.² G02C *5/20*

U.S. Cl. 351—118 **7 Claims**



1. An eyeglass frame comprising:

an eyepiece;

a pair of temples, each of said temples adapted to be mounted at one end of said eyepiece, whereby each of said temples have one surface facing one another and an external surface, each of said external surfaces of said temples having a plurality of vertical ridges near said eyepiece;

hinge means for rotatably connecting each of said temples to said eyepiece;

means between each of said temples and said hinge means for adjustably mounting said temple on said hinge means to vary the length of said temple relative to said eyepiece, said means including

an elongated slot in said temple,

pin means having one end mounted on said hinge means passing through said slot, and

resilient clamp means fixed to the other end of said pin means and engaging said vertical ridges on said temple, for clamping said temple to said hinge means.

4,131,341

OPHTHALMIC DEVICE

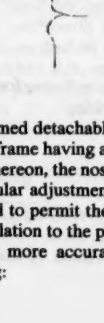
James B. Bradley, Jr., 110 Monteleon Dr., West Monroe, La. 71291

Filed Apr. 25, 1977, Ser. No. 790,382

The portion of the term of this patent subsequent to Jun. 28, 1994, has been disclaimed.

Int. Cl.² G02C *5/02, 5/12*

U.S. Cl. 351—132 **10 Claims**



1. A one-piece preformed detachable nosepiece for use with an ophthalmic eyeglass frame having a pair of facing nosepiece mounting tabs formed thereon, the nosepiece being designed to permit vertical and angular adjustment to fit the bridge of the user's nose precisely and to permit the adjustment of the level of the eyeglass lens in relation to the plane of the user's eyes so that the lens conforms more accurately to the ophthalmic prescription, comprising:

(a) a generally box shaped forward portion having formed thereupon a pair of opposed side surfaces, for positioning between the mounting tabs, and having formed thereupon a front and a rear surface, said box shaped forward portion having formed therein and between said opposed side surfaces a vertical elongated slot extending from one opposed side surface to the other opposed side surface;

(b) a nose bridge mount formed on the rear surface of said box shaped portion and being formed with a pair of rearwardly and outwardly extending projections for positioning on the bridge of the nose of the user of the ophthalmic eyeglass frame and to provide a large surface for positioning and retaining the ophthalmic eyeglass frame in a fixed position; and

(c) a generally concaved surface formed between said pair of projections and being formed in the shape of the bridge of the user's nose and being narrower at the top than at the bottom thereby providing a concave shape that retards slippage of the nosepiece.

4,131,342

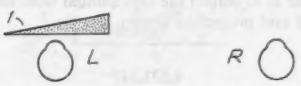
STEREOSCOPIC OPTICAL VIEWING SYSTEM

Leslie P. Dudley, 11088 Ophir Dr., #307, Los Angeles, Calif. 90024

Continuation of Ser. No. 606,763, Aug. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 518,356, Oct. 29, 1974, abandoned. This application Dec. 14, 1976, Ser. No. 750,430

Int. Cl.[2] G03B *21/32*

U.S. Cl. 352—43 **5 Claims**



1. A method for producing an animated cartoon program for exhibition on a motion picture or television screen, and for viewing the animated cartoon program, including the following steps: making two sequences of drawings, one representing background and the other representing foreground, the foreground drawings being produced with opaque pigment on transparent supports and being superimposed in order on the background drawings in close proximity thereto during the photographic operation; progressively changing in a horizontal direction the locations of characters or details in the foreground drawings relative to the locations of characters or details in the background drawings, so that when the program is exhibited the transit times of said moving characters or details will be within the limits of 1 to 8 seconds; and viewing the program through a monocular neutral filter having a density substantially between 0.9 and 1.1 to achieve a stereoscopic effect due to differential visual time-lag.

4,131,343

HIGH SPEED MOVIE CAMERA

Robert D. Shoberg, Ventura, Calif., assignor to Photonic Systems, Inc., Sunnyvale, Calif.

Filed Jun. 15, 1977, Ser. No. 806,623

Int. Cl.[2] G03B *41/00*

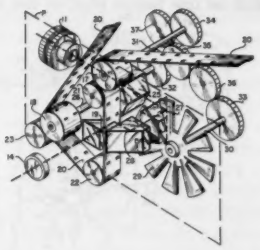
U.S. Cl. 352—84 **5 Claims**

1. A high speed movie camera including, in combination:

(a) first and second sprocket rollers for passing film into and receiving said film from a film gate respectively;

(b) an optical means for imaging a scene to be photographed on said film gate including a multi-surfaced prism connected to said second sprocket roller for rotation therewith to cause an imaged scene to move along said film gate with movement of said film through the film gate and first and second light directing means for folding the optical path between said multi-surfaced prism and said film gate to accommodate a longer back focus objective lens within a given sized casing than would otherwise be accommodated;

(c) shutter means passing in between said first and second light directing means intercepting light passed to said film gate after each rotation of said multi-surfaced prism through a given circumferential distance to enable a series



of separate images to be successively recorded on the film while the film continuously moves; and

(d) positive interconnecting means between said multi-surfaced prism, said shutter means and said first sprocket roller for providing simultaneous rotation thereof in a predetermined synchronous relationship.

4,131,344

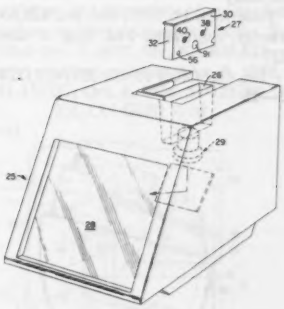
MOTOR CONTROL SYSTEM FOR AUTOMATIC PROCESSING OF PHOTOGRAPHIC FILM STRIPS

Herbert L. Hardy, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 3, 1977, Ser. No. 756,542

Int. Cl.[2] G03C *11/00*

U.S. Cl. 352—130 **6 Claims**

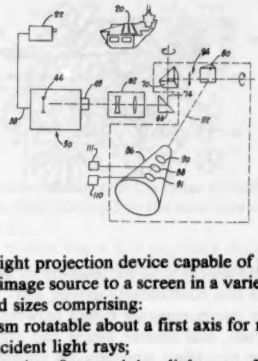


1. Apparatus for use with a spool adapted to wind a photographic film strip thereonto upon being driven and distributing means for applying film processing material upon the film strip as it is wound upon the spool, said apparatus comprising a motor operable to drive the spool, means for receiving and storing an electrical charge, means to apply current to said receiving and storing means as the film strip is being wound upon the spool and motor speed control means responsive to the charge stored in said receiving and storing means having reached a first predetermined level for changing the speed of said motor in a first manner and for subsequently changing the speed of said motor in a second manner when the stored charge in said receiving and storing means has reached a second predetermined level higher than said first predetermined level.

4,131,345
VISIBLE LIGHT PROJECTION DEVICE

Jerome T. Carollo, Ormond Beach, Fla., assignor to The Singer Company, Binghamton, N.Y.

Filed Oct. 27, 1977, Ser. No. 845,884
Int. Cl.[2] G03B 29/00
U.S. Cl. 352—132 12 Claims



1. A visible light projection device capable of projecting an image from an image source to a screen in a variety of angular orientations and sizes comprising:

(a) a first prism rotatable about a first axis for receiving and bending incident light rays;

(b) a second prism for receiving light rays from the first prism, the second prism rotatable about a second axis, transverse to the first axis, and mounted for revolution about said first axis;

(c) a zoomable lens fixed relative to the second prism and capable of receiving the light rays from the second prism and projecting an image on the screen.

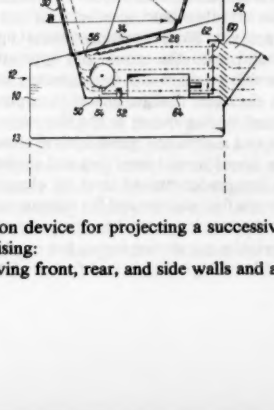
(d) a first means for controlably rotating said first prism and for revolving said second prism; and

(e) second means for rotating said second prism.

4,131,346
PROJECTOR

Rolf Dieckhoff, Marienstrasse 26, D-7050 Waiblingen, Fed. Rep. of Germany

Filed Aug. 18, 1977, Ser. No. 825,635
Claims priority, application Fed. Rep. of Germany, Sep. 7, 1976, 2640227
Int. Cl.[2] G03B 31/00, 21/16, 21/28
U.S. Cl. 353—15 14 Claims



1. A projection device for projecting a successive series of pictures comprising:

a housing having front, rear, and side walls and at least one window opening provided in the front wall of said housing;

a generally planar projection screen which is disposed closely adjacent to the rear wall of said housing and which can be viewed through said window opening, said screen being slanted upwardly and rearwardly toward said rear wall;

a plastic unitary insert mounted with said housing which includes a transparent inspection window pane covering said window opening, an upper support face for supporting a projector, and a device for fixing a deflection mirror at a desired angle of deflection;

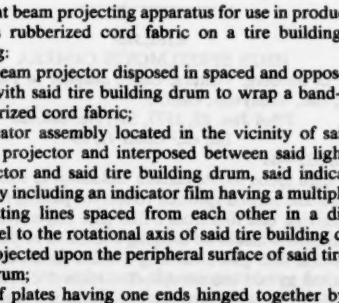
a projector having a projection axis, a lens having an optic axis and a picture chute for the successive receipt therein of slides, said chute being mounted with an abutment which is adapted to retain the slide received therein in a projection position which is eccentric with respect to said optical axis of said lens, said projector being supported on said upper support face outside of the viewing range defined between said window opening and said projection screen and adjacent to said rear wall of said housing in such a manner that the path of rays emitted therefrom is directed towards the front wall of said housing, said optic axis of said lens and said projection axis being inclined downwardly and forwardly towards the front wall of said housing with said projection axis being inclined downwardly and forwardly at a greater angle than said optic axis; and

a single deflection mirror disposed adjacent to said front wall of said housing above said window opening which is fixed at a desired angle of deflection by said device for fixing so as to deflect the rays emitted from said projector toward said projection screen.

4,131,347
LIGHT BEAM PROJECTING APPARATUS

Mitsuo Hashimoto, Kodaira, and Mitsuo Koguchi, Omuta, both of Japan, assignors to Bridgestone Tire Company Limited and Mitsui Miike Seisakusho Engineering Company Limited, both of Tokyo, Japan

Filed Apr. 11, 1977, Ser. No. 786,626
Claims priority, application Japan, Apr. 17, 1976, 51-43884
Int. Cl.[2] B29H 17/00; G03B 21/26
U.S. Cl. 353—28 5 Claims



1. A light beam projecting apparatus for use in production of an endless rubberized cord fabric on a tire building drum, comprising:

a light beam projector disposed in spaced and opposed relation with said tire building drum to wrap a band-formed rubberized cord fabric;

an indicator assembly located in the vicinity of said light beam projector and interposed between said light beam projector and said tire building drum, said indicator assembly including an indicator film having a multiplicity of indicating lines spaced from each other in a direction parallel to the rotational axis of said tire building drum to be projected upon the peripheral surface of said tire building drum;

a pair of plates having one ends hinged together by hinge means to be operable for facilitating entry of said indicator film therebetween and each having a central portion formed transparently and convexedly toward said tire building drum; and

a focus lens assembly arranged between said tire building drum and said indicator assembly and including at least a focus lens in alignment with the light beam projected through said indicator film by said light beam projector so as to focalize and enlarge indicated lines projected on the peripheral surface of said tire building drum.

4,131,348

COLLAPSIBLE MICROFILM READER

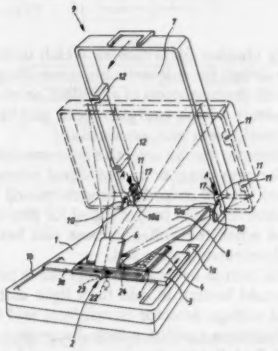
Wilfried Hofmann; Guenther Leuder, both of Taufkirchen; Walter Rauffer, Munich; John Krueger, Munich, and Adolf Koopmann, Munich, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert AG., Leverkusen, Fed. Rep. of Germany

Filed Apr. 27, 1977, Ser. No. 791,471

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618470

Int. Cl.[2] G03B *21/30*

U.S. Cl. 353—72 **5 Claims**



1. In a collapsible microfilm reader with a body containing a projector, the reader having a rectangular cover containing a projection surface which is longer in one direction of the cover than the other, the cover being hingedly attached to the body, the improvement which comprises at least one releasable hinge connection between the body and the cover, the hinge connection having a first connecting element connected to the body and a second, mating connecting element connected to a first edge of the cover, and at least one further third connecting element similar to the second connecting element on one of the sides of the cover that is perpendicular to said first edge thereof.

4,131,349

LOW COST SENSITOMETER WHICH PROVIDES HIGHLY ACCURATE READINGS

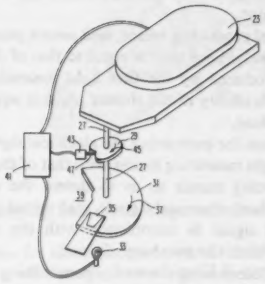
Philip E. Tobias, 1872 Watson Rd., Abington, Pa. 19001

Filed Aug. 8, 1977, Ser. No. 822,724

Int. Cl.[2] G03B *41/00*

U.S. Cl. 354—20 **1 Claim**

1. A light sensitometer which is employed to permit photosensitive material to be subjected to an accurately determined exposure of light comprising in combination: housing means having a top piece, said top piece formed so that at least a portion thereof is a transparent section; graded gray scale means formed to permit predetermined amounts of light to pass therethrough, said graded gray scale means disposed to be in the path of any light passing through said transparent section; light source means formed to be alternatively energized and deenergized and disposed within said housing means so that light therefrom can pass through both said transparent section and said graded gray scale means; sector shutter means mounted on a shaft and formed to be capable of making a complete rotation and further formed and disposed with respect to said light source and said transparent section so that when said sector shutter is at rest and during the initial part of said complete rotation from rest, said sector shutter will block light from passing from said light source to said transparent section and further formed so that during a later portion of said complete rotation said sector shutter will permit light to pass from said light source to said transparent section, whereby during a complete rotation of said sector shutter said light source will be energized for a sufficiently long period so that its power input and its light output will be stabilized before



light is permitted to pass to said transparent section; cam means mounted on said shaft; motor means coupled to said shaft to cause said shaft to rotate when said motor is energized; electrical circuitry means coupled to said cam means, said motor means and said light source whereby when said light source is energized said motor means will be energized to cause said sector shutter and said cam means to be rotated and whereby said cam means will cause said circuitry means to automatically deenergize said motor means and said light source at a predetermined time.

4,131,350

EXPOSURE CONTROL DEVICE FOR CAMERA

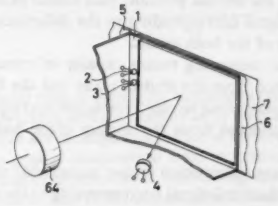
Takashi Uchiyama, Yokohama; Ryoichi Suzuki, Kawasaki; Tokuichi Tsunekawa, Yokohama; Hiroyoshi Kawana; Yusuke Ono, both of Tokyo, and Mutsuhide Matsuda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1977, Ser. No. 839,832

Claims priority, application Japan, Oct. 8, 1976, 51-121736; Oct. 8, 1976, 51-121737; Oct. 8, 1976, 51-121738

Int. Cl.[2] G03B *7/08*

U.S. Cl. 354—31 **13 Claims**



1. An exposure amount control device for a camera comprising:

a light emitting means capable of illuminating the film portion outside of picture frame,

a first light measuring means capable of measuring the light emitted from the light emitting means and reflected from the film portion outside of picture frame, said means producing an electrical signal corresponding to the light reflected from the film portion outside of picture frame,

a second light measuring means capable of measuring the light reflected from the shutter plane and the film picture

plane, said means producing an electrical signal corresponding to the light reflected from the shutter plane and the film picture plane,

a photographing information setting means, said means producing an electrical signal corresponding to the set photographing information,

a computing means for computing the electrical signal output from the second light measuring means and the electrical signal output from the photographing means, said means producing an electrical signal corresponding to the computed value,

a standard signal producing means, said means producing an electrical signal whose level is equal to that of the electrical signal produced by the first light measuring means when the reflexibility of the shutter plane is equal to that of the film plane,

a detecting means for comparing the electrical signal output of the first light measuring means with that of the standard signal producing means so as to detect the difference between the both electrical signals, said means producing an electrical signal in accordance with the difference between the both electrical signals, and

a shutter time determining means for determining the exposure time of the shutter in accordance with the electrical signal output of the computing means, said means including a compensating means for compensating the exposure time with the electrical signal output of the detecting means so as to obtain a proper exposure time.

6. An exposure amount control device for a camera comprising;

a first light measuring means capable of measuring the light reflected from the shutter plane and the film plane, said means producing an electrical signal corresponding to the light reflected from the shutter plane and the film plane,

a change over means connected to the output terminal of the first light measuring means, said means being changed over into a first position before taking a picture and into a second position at taking a picture,

a memory means for memorizing the electrical signal output from the first light measuring means corresponding to the light reflected from the shutter plane when the change over means is in the first position,

a comparison means for comparing the electrical signal output of the first light measuring means corresponding to the light reflected from the film plane with the value memorized in the memory means when the change over means is in the second position, said means producing an electrical signal corresponding to the difference between the outputs of the both means,

a second light measuring means capable of measuring the light reflected from the shutter plane and the film plane, said means producing an electrical signal corresponding to the light reflected from the shutter plane and the film plane,

a photographing information setting means, said means producing an electrical signal corresponding to the set photographing information,

a computing means for computing the electrical signal output of the second light measuring means and that of the photographing information setting means, said means producing an electrical signal corresponding to the computed value, and

a shutter time determining means for determining the exposure time corresponding to the electrical signal output of the computing means, said means including a compensating means for compensating the exposure time with the electrical signal output of the comparison means so as to obtain the proper exposure time.

4,131,351

BATTERY CHECKER FOR A CAMERA WITH A FLASH LIGHT UNIT

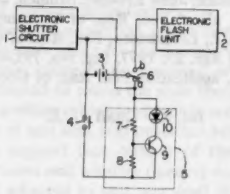
Hiroshi Iwata, and Tetsuo Yamaoka, both of Osaka,, Japan, assignors to West Electric Co., Ltd., Osaka, Japan

Filed Feb. 16, 1977, Ser. No. 769,215

Claims priority, application Japan, Feb. 20, 1976, 51/18138; Jul. 19, 1976, 51/86457

Int. Cl.[2] G03B *15/05, 7/00;* H01H *9/00*

U.S. Cl. 354—60 F **7 Claims**



1. A battery checker for a camera which includes an electronic shutter circuit for automatically controlling exposure in accordance with the brightness of an object, an electronic flash unit, and a battery which energizes both said shutter circuit and said electronic flash unit, comprising:

a voltage detector circuit selectively connectable with said battery for providing an output signal when the voltage across said battery exceeds a predetermined value;

means responsive to said output signal for providing a visual indication when the voltage across said battery exceeds said predetermined value; and,

a mechanical switch having a first operative position which connects said battery to said flash light unit and disconnects said voltage detector circuit from said battery and a second operative position which disconnects said battery from said flash light unit and connects said voltage detector circuit with said battery.

4,131,352

PHOTOGRAPHIC APPARATUS OF THE SELF-DEVELOPING TYPE

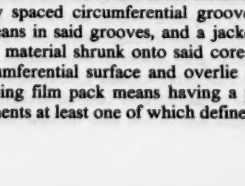
Günter Fauth, Unterhaching, and Herbert Müller, Assling, both of Fed. Rep. of Germany, assignors to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed May 27, 1977, Ser. No. 801,386

Claims priority, application Fed. Rep. of Germany, May 29, 1976, 2624209

Int. Cl.[2] G03B *17/50*

U.S. Cl. 354—86 **8 Claims**



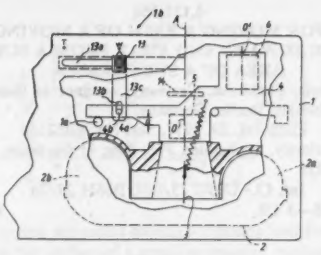
1. In a photographic apparatus of the self-developing type, a combination comprising a pair of pressure rollers defining with one another a nip, one of said rollers having a rigid cylindrical core provided in an outer circumferential surface thereof with a pair of axially spaced circumferential grooves, elastically compressible means in said grooves, and a jacket of resilient synthetic plastic material shrunk onto said core so as to surround said circumferential surface and overlie said grooves; and self-developing film pack means having a pair of juxtaposed sheet elements at least one of which defines an exposure

area, edge binders externally overlapping transversely spaced edges of said sheet elements which bound respective margins of said exposure area, and a supply of processing fluid captured between said sheet elements and adapted to be spread over said exposure area, said elastically compressible means being adapted to yield to said edge binders when said film pack means passes through said nip so that the pressure on said edge binders cannot prevent said processing fluid from spreading to said margins.

4,131,353
PHOTOGRAPHIC CAMERA

Dieter Engelsmann, Unterhaching, Fed. Rep. of Germany, assignor to AGFA-Gevaert AG, Leverkusen, Fed. Rep. of Germany

Filed Dec. 20, 1976, Ser. No. 752,315
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1975, 2558276
Int. Cl.[2] G03B *3/00, 13/02*
U.S. Cl. 354—197 **8 Claims**



1. In a multiple-lens photographic camera having an optical axis, a combination comprising a housing; at least two different photographic lenses; means including a carrier slidable transverse to said optical axis and mounting said lenses for displacement in said housing also transverse to said optical axis between respective lens-changing positions in each of which a different one of said lenses is located on said optical axis; and means for imparting to at least one of said lenses a component of movement in direction longitudinally of said optical axis in response to a displacement of said lenses in said direction transverse to said optical axis, including cooperating cam and follower portions on said housing and said carrier for effecting movement of said carrier in said longitudinal direction in response to sliding of said carrier in said transverse direction.

4,131,354
SELECTIVE MODE ANGLE FINDER FOR SLR CAMERA

Teruo Hagiwara, Kawagoe, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 5, 1977, Ser. No. 784,758
Claims priority, application Japan, Apr. 7, 1976, 51/42702
Int. Cl.[2] G02B *23/14;* **G03B** *13/08, 19/12*
U.S. Cl. 354—224 **6 Claims**

1. A selective mode viewfinder attachment for a single lens reflex camera, comprising:

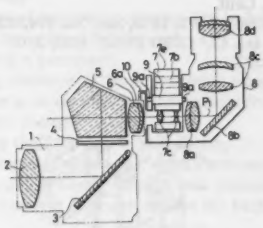
(a) a bent cylindrical housing member having an L-shaped cross-section and open at both ends,

(b) a mirror disposed in the housing member to define an optical axis therethrough from one end to the other having an angular bend of approximately 90°,

(c) a telescopic optical system disposed in the housing member in alignment with the optical axis,

(d) a cylinder member rotatably mounted in the housing member about an axis parallel to but offset from the optical axis, said cylinder member including a solid portion selectively alignable with the optical axis of the attachment to thereby block any reverse incident light from entering the viewfinder eyepiece,

(e) a pair of spaced passages defined in the cylinder member and extending longitudinally therethrough parallel to the cylinder axis and radially spaced therefrom a distance equal to the offset distance between the cylinder axis and the optical axis,



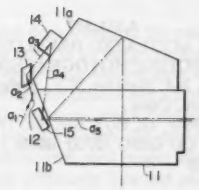
(f) magnifying lens means disposed in one of the passages, and

(g) means for attaching one end of the housing member to the viewfinder eyepiece of an SLR camera in alignment with the optical axis thereof, whereby picture composition and accurate focusing may be implemented by rotating the cylinder member to align a selected one of the passages with the optical axis of the attachment.

4,131,355
FINDER OPTICAL SYSTEM FOR SINGLE LENS REFLEX PHOTOGRAPHIC CAMERAS

Tadashi Kimura, Tokyo, and Fumitaka Watanabe, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 25, 1977, Ser. No. 790,752
Claims priority, application Japan, Apr. 27, 1976, 51-52060[U]
Int. Cl.[2] G03B *13/02, 19/12*
U.S. Cl. 354—225 **2 Claims**



1. A finder optical system for single-lens reflex photographic cameras wherein an even number of at least four small reflecting surfaces are arranged on the front surface of a pentagonal prism, an optical information such as graduation on the diaphragm dial or shutter speed dial arranged on the diaphragm ring or shutter ring of the camera is reflected consecutively by said small reflecting surfaces so as to emerge from said pentagonal prism, whereby said optical information is visible at any optional position around the field of view in the finder, and wherein said reflecting surfaces consist of a first small reflecting surface, a second small reflecting surface, a third small reflecting surface and a fourth small reflecting surface, said first small reflecting surface functioning to reflect said optical information upward, said second small reflecting surface functioning to further reflect the optical information reflected by said first small reflecting surface in such a way that said optical information is directed upward along the front upper surface of said pentagonal prism, and said third and fourth small reflect-

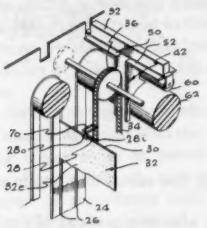
ing surfaces functioning to permit observing an image of the optical information from said second small reflecting surface at any desired position around the field of view in a finder.

4,131,356

SHEET FILM PROCESSOR

Gunter Schmidt, Malibu, Calif., assignor to Cubic Productron, Chula Vista, Calif.

Filed May 2, 1975, Ser. No. 574,003
Int. Cl.² G03D *17/00, 3/02, 3/08*
U.S. Cl. 354—322 **2 Claims**



1. Apparatus for processing a sheet of film by moving it through tanks containing processing solutions comprising:

means defining a sheet path which includes a plurality of loop portions, each leading down into and up out of one of said tanks, said means comprising a pair of parallel edge guide means extending along said path for engaging opposite side edge portions of said sheet of film;

a plurality of push fingers;

a plurality of support fingers; and

belt means for moving each of said push and support fingers along at least one of said loop portions to push sheets of film therealong;

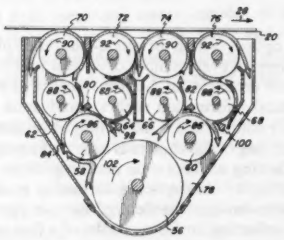
each of said push fingers being movable with respect to said belt means, and each of said support fingers located immediately behind one of said push fingers along the length of said path, to stop the downward fall of a film sheet onto a push finger.

4,131,357

SEQUENTIALLY ACTIVATED DEVELOPMENT SYSTEM FOR AN ELECTROPHOTOGRAPHIC PRINTER

Richard L. Forbes, 2nd, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 21, 1977, Ser. No. 779,669
Int. Cl.² G03G *15/00;* B05B *5/02*
U.S. Cl. 355—3 DD **26 Claims**



1. An apparatus for developing a latent image arranged to be recorded on a surface, including:

a plurality of developing rollers disposed closely adjacent to the surface;

means for activating and de-activating said plurality of developing rollers sequentially with said plurality of developing rollers being activated and de-activated in the same order;

a housing defining a chamber for storing a supply of developer material therein;

a cylindrical member having a plurality of buckets disposed about the periphery thereof for advancing developer material from the chamber of said housing:

at least one transport roller disposed adjacent to the buckets of said cylindrical member and arranged to receive the developer material therefrom;

at least a pair of feed rollers disposed closely adjacent to said transport roller for receiving developer material therefrom, each of said pair of feed rollers being associated with one of said developing rollers for furnishing an individual supply of developer material thereto; and

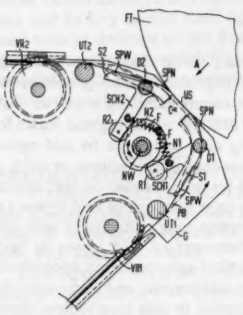
at least one blade member positioned closely adjacent to said pair of feed rollers to control the amount of developer material advanced to each of said pair of feed rollers from said transport roller.

4,131,358

DEVICE FOR MOVING A PATH OF A MOVING DATA CARRIER TOWARD AND AWAY FROM A SURFACE AREA OF A SUB-CARRIER

Josef Windele, Puchheim, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Jul. 29, 1977, Ser. No. 820,216
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1976, 2636326
Int. Cl.² G03G *15/044;* B65H *23/26*
U.S. Cl. 355—3 TR **13 Claims**



1. A device for moving a path of a moving data carrier toward and away from a surface of a sub-carrier and particularly for moving a path of a moving paper web toward and away from a surface area of a photoconductive sub-carrier at a reproducing station of an electrostatic printer, said device comprising means supporting and moving a data carrier along a given path, said means for supporting and moving including two pivotal support members, each of said support members being mounted on a frame to pivot around respective pivot points, and means for pivoting said support members between a first position with the data carrier disposed closely adjacent the surface area of the sub-carrier and a second position with the data carrier spaced from the surface area of the sub-carrier, each of said pivot points being arranged symmetrically to a point on the surface area of the sub-carrier at which the data carrier lies closest to the sub-carrier as the support members assume said first position, each of said support members having a first data carrier engaging zone on one side of its pivot point adjacent said point on said surface area and a second data carrier engaging zone on the opposite side of its pivot point, each of said data carrier engaging zones being in continual engagement with the data carrier and of a configuration so that

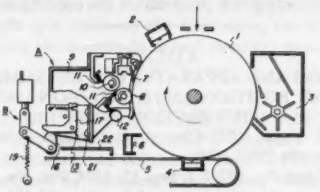
the data carrier is tautly engaged by said zones regardless of the position of the pivotal support members.

4,131,359

SENSITIVE MEDIUM CLEANER FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

Ko Honda, Ebina, Japan, assignor to Rank Xerox Limited, London, England

Filed Apr. 27, 1977, Ser. No. 791,355
Claims priority, application Japan, Apr. 28, 1976, 51/052503[U]
Int. Cl.[2] G03G *21/00, 15/10*
U.S. Cl. 355—15 2 Claims



1. A copying apparatus having a cleaning unit for removing toner from the surface of a sensitive imaging medium comprising:

a cleaning blade for removing toner from said surface;

a toner collection member with a collection roll for receiving toner removed by said blade and a pinch roll cooperating with said collection roll to define a nip comprising an entrance to a toner collection sump;

drive means for driving said collection roll and said pinch roll in a first movement to transport the toner removed by said blade away from said surface toward said collection sump;

means for supporting said blade and said collection roll in a housing for a second, pivotal, movement toward and away from said surface between respective operative and inoperative positions;

means for automatically providing said second, pivotal, movement of said blade and said collection roll away from said surface at the completion of a copying operation in response to the non-operation of said copying apparatus;

toner fall preventing means responsive to said second movement of said blade and said collection roll away from said surface for continuing said first movement of said collection roll to continue the transporting of toner by said collection roll away from said surface during said second movement of said blade and said collection roll away from said surface,

said toner fall preventing means including energy accumulation means comprising a spring associated with said drive means for said collection roll and means for loading said spring during operation of said copying apparatus to accumulate energy from said drive means and for unloading said spring after said apparatus has stopped operating for applying said accumulated energy to said collection roll to continue said first movement thereof after the stopping of the copying apparatus,

and said toner fall preventing means further including selective coupling means for selectively coupling said spring to said collection roll as it is unloaded to provide said continued first movement.

4,131,360

DUPLEX REPRODUCTION SYSTEM EMPLOYING COPY SHEET CLEANER

John F. O'Brien, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 27, 1977, Ser. No. 801,111
Int. Cl.[2] G03G *21/00*
U.S. Cl. 355—15 2 Claims

1. A method of improving copy quality in duplex reproduction systems comprising the steps of:

(a) providing a processor;

(b) feeding sheets with front and back sides through said processor to receive images of document front sides on the front sides thereof;

(c) cleaning the back side of said sheets;

(d) advancing said sheets to a sheet receiving tray;

(e) refeeding said sheets through said processor to receive back side images of documents on the back sides thereof; and

(f) cleaning the front side of said sheets; and receiving said sheets in an output means.

4,131,361

ILLUMINATION DEVICE

Tadashi Morokuma, and Kenichi Oinoue, both of Tokyo, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 8, 1977, Ser. No. 814,119
Claims priority, application Japan, Jul. 16, 1976, 51-84553; Jul. 16, 1976, 51-84554
Int. Cl.[2] G03B *27/54*
U.S. Cl. 355—70 3 Claims

1. An illumination device used in the case of forming, on a dupe film, a visible copy of an image pattern of a master film, comprising an elongated bar-shaped light source including a center portion having a brightness and a peripheral portion for emitting light in all directions, and a collimator lens having an optical axis that passes through the center high brightness portion of said light source, said master film being located at directly below said collimator lens and placed on said dupe film.

4,131,362

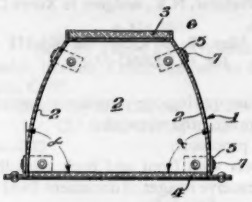
LIGHT-MIXING COMPARTMENT FOR A LIGHT PROJECTOR

Mario Gandini, Brixen, Italy, assignor to DURST AG Fabrik Fototechnischer Apparate, Bolzano-Bozen, Italy

Filed Aug. 17, 1977, Ser. No. 825,293
Claims priority, application Italy, Aug. 24, 1976, 4846 A/76
Int. Cl.[2] G03B *27/76*
U.S. Cl. 355—71 6 Claims

1. A light-mixing compartment for a photographic color printing apparatus having a light entrance and light emergence sections comprising a plurality of externally convexly curved internally reflective side sections connecting the light emergence to the light entrance sections, a light diffusing screen is disposed adjacent the light emergence section of the compartment, the convexly curved side sections having an angle of curvature, and the angle between a tangent to the portion of the side section disposed adjacent the light emergence section

ranges from about 75° to 105° whereby the quality and distribution of the light mixture is substantially uniform, the cross-sectional area of the compartment increasing from light entrance to light emergence sections.

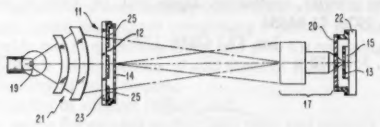


4,131,363

PELLICLE COVER FOR PROJECTION PRINTING SYSTEM

Vincent Shea, and Walter J. Wojcik, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1977, Ser. No. 857,632
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—75 **5 Claims**



1. A projection printing mask comprising a pattern of opaque and transparent areas formed on a transparent substrate and a cover bonded to the substrate said cover including a pellicle which is a transparent film having a thickness of from about 0.2 to 6 microns which is spaced from about 1 to 125 millimeters from the pattern such that the pattern is protected against damage and dirt and the images of any dirt particles on the outer surface of the pellicle are maintained out of focus so that the images will not be printed when the pattern is printed on a light sensitive substrate.

2. A projection printing system for forming an image on a light sensitive substrate said system comprising a mask having a transparent substrate with a pattern of opaque and transparent areas formed on one surface thereof, an illuminating system for directing light through the mask to the light sensitive substrate, optical means for forming a focussed image of the pattern on the light sensitive substrate and a pellicle cover means for maintaining the images of any dirt particles on the mask out of focus so that the images will not be printed on the light sensitive substrate, said pellicle cover means being bonded to the transparent substrate and completely covering the pattern and including a pellicle which is a thin transparent film having a thickness of about 0.2 to 6 microns and being spaced from about 1 to 125 millimeters from the pattern such that the cover means does not substantially effect the optical path length of the system.

4,131,364

PAPER GUIDE DEVICE FOR COPYING MACHINES

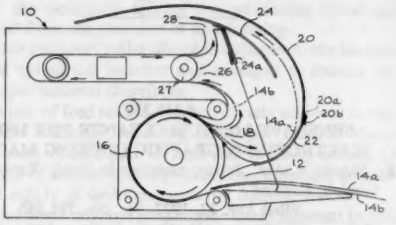
Jose A. Moreno, 612 Westboro Ave., Alhambra, Calif. 91803

Filed Nov. 3, 1977, Ser. No. 848,278
Int. Cl.[2] G03B *27/30*
U.S. Cl. 355—106 **11 Claims**

1. In a paper guiding device for copied original sheets being discharged froman opening in a copying machine, comprising:

(a) a first upwardly extending paper guiding means, mounted below the said opening along which the discharged original is caused to move upwardly;

(b) a second paper guiding means, mounted at a location on the copying machine above and extending beneath said first paper guiding means, so as to create a passage therewith, through which a portion of said origianl will pass before coming to a standstill on the copying machine.

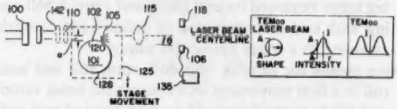


4,131,365

METHOD AND APPARATUS FOR DETERMINING OBJECT POSITION AND DIMENSION USING A DIFFRACTION WAVE

Timothy R. Pryor, 1578 Cherrylawn Crescent, Windsor, Ontario, Canada (N9E 1P4)

Division of Ser. No. 505,777, Sep. 13, 1974, Pat. No. 4,009,965, which is a continuation-in-part of Ser. No. 253,421, May 15, 1972, Pat. No. 3,884,581, and Ser. No. 358,547, May 9, 1973, Pat. No. 3,883,249. This application Nov. 24, 1976, Ser. No. 744,755
Int. Cl.[2] G01B *9/02, 11/26*
U.S. Cl. 356—356 **12 Claims**



1. A method of determining the position of an object comprising the steps of directing an electromagnetic wave front of known spatial intensity distribution from a wave source onto a boundary of an object to produce a diffraction boundary wave, determining from said diffraction wave the portion of said wave of known spatial intensity distribution intercepted by said object boundary and determining therefrom the position of said object.

4,131,366

DIRECTION INDICATING DEVICE

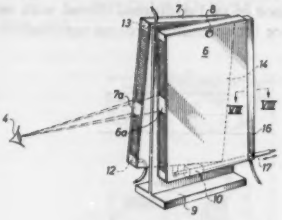
Magnus R. Forss, Eremitvägen 4, 183 50 Täby, Sweden

Filed Jan. 13, 1977, Ser. No. 759,214
Claims priority, application Sweden, Jan. 27, 1976, 7600840
Int. Cl.[2] B64D *45/08*
U.S. Cl. 356—140 **2 Claims**

1. A device for indicating to an observer in a vehicle the deviation between the actual direction to a remote object and a predetermined reference direction, comprising

first and second light transmitting units mounted on support means for angular movement of one relative to the other and in position for each of said units to present a separate visual display visible to the observer, each of said units having an input end facing the object and an output end facing the observer and including an array containing a plurality of elongated light guides which are optically insulated from one another and oriented with their longitudinal axes parallel to one another for passing substantially only plane-parallel light beams through said array,

the input ends of said units being positioned to receive light from one or more natural or artificial sources, and the output ends of said units being positioned each to present a light spot visible to the observer, the units being



angularly movable relative to each other around an axis perpendicular to the longitudinal axes of the light guides and to said input and output ends; the displacement of the one light spot relatively the other along the output ends indicating the magnitude of said direction deviation.

4,131,367

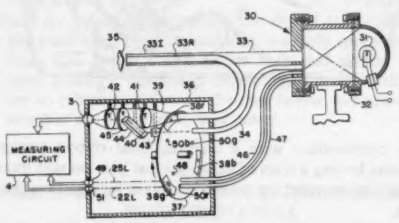
TRISTIMULUS COLORMETER WITH INTERNAL REFLECTANCE COMPENSATION

Park French, Aurora, and William H. Conaway, Paris, both of Ohio, assignors to Sterndent Corporation, Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 721,108, Sep. 7, 1976. This application Nov. 2, 1976, Ser. No. 737,905

Int. Cl.² G01J *3/46, 3/48*

U.S. Cl. 356—405 **30 Claims**



1. An optical measuring apparatus, comprising:

transducer means for producing an electrical output representative of an input thereto,

means for directing an unknown input to said transducer means causing the latter to produce an unknown electrical signal,

integrator means for integrating in one polarity direction one of said unknown electrical signal and a reference electrical signal for a predetermined duration to produce an integrated signal level and then the other of said electrical signals in the opposite direction,

output means for producing an electrical output signal indicative of the relative time after said integrator means commences the latter integration that the output of said integrator means achieves a pre-established level, whereby said electrical output signal is representative of a comparison of said unknown and reference electrical signals and, thus, of the relative value of said unknown input, and

compensating means for changing the relative time at which said electrical output signal achieves said pre-established level, said compensating means including means for adding a compensating voltage to said unknown electrical signal for simultaneous integration therewith.

4,131,368

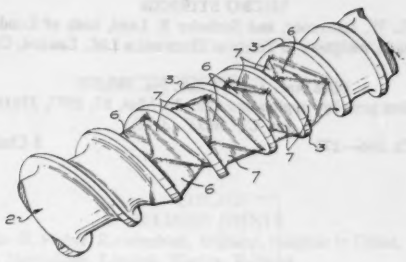
SCROLLS FOR EXTRUDING MACHINES

Michael I. Iddon, Leyland, England, assignor to Iddon Brothers Limited, Lancaster, England

Continuation-in-part of Ser. No. 675,408, Apr. 9, 1976, abandoned. This application Nov. 18, 1977, Ser. No. 852,869

Int. Cl.² B29B *1/10*

U.S. Cl. 366—81 **2 Claims**



1. A rotatable scroll for an extruding machine comprising a series of helical flights and means in at least one longitudinal zone along the scroll providing a series of facets arranged in pairs between the helix flights, the facets of each pair being alternatively angled in an upward and then downward direction relatively to the helix leading or trailing edges, the pairs of facets being repeated along the length of the zone, and disposed around the root diameter of the scroll between successive flights in the zone, each of said surfaces being inclined inwardly from adjacent the outer periphery of the scroll flight.

4,131,369

CENTRIFUGAL HOMOGENIZER

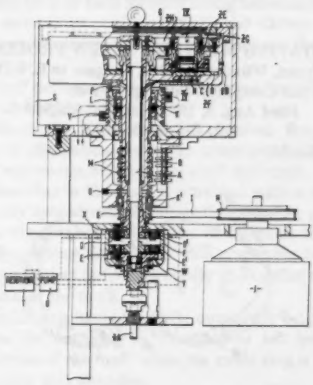
Manfred Gordon, 11 Belle Vue Rd., Wivenhoe, nr. Colchester, Essex, and Bernard W. Ready, 22 Wesley Ave., Colchester, Essex, both of England

Filed Jul. 27, 1977, Ser. No. 819,454

Claims priority, application United Kingdom, Aug. 6, 1976, 32833/76

Int. Cl.² B01F *9/00*; B04B *1/00, 9/08*

U.S. Cl. 366—146 **10 Claims**



1. A method of mixing a composition in the liquid state, comprising the steps of:

enclosing the components of the composition in a tube;

positioning the tube by tube location means carried by a member which is mounted for spinning about a spin axis, the tube location means being mounted for rotation relative to the member about an axis of rotation substantially parallel to said spin axis and spaced therefrom; and

spinning the member about said spin axis for a period of time and rotating the location means about said axis of rotation for at least part of the spinning period;

whereby the tube is subjected to spinning about said spin axis of the member, and to end-to-end rotation about said axis of rotation of the tube location means.

4,131,370

MICRO STIRRER

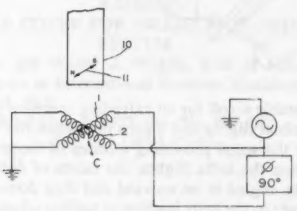
Noel L. W. Lawrence, and Surinder S. Latti, both of London, Canada, assignors to Temtron Electronics Ltd., London, Canada

Filed Apr. 1, 1977, Ser. No. 783,872

Claims priority, application Canada, Mar. 17, 1977, 274181

Int. Cl.[2] B01F *13/08*

U.S. Cl. 366—273 **5 Claims**



1. A micro stirrer for stirring the solution within a cuvette comprising:

(a) a longitudinal magnetic member freely mounted within the cuvette and adapted to rotate in response to a magnetic field;

(b) four coils lying in the same plane each orthoginally placed relative to adjacent coils and said coils placed below the exterior of the cuvette; and,

(c) means for energizing, sequentially, each of the said coils momentarily with a square wave form whereby a rotational magnetic field is created by the coils, a portion of the magnetic field extending upwardly into the cuvette to influence the magnetic member and to thereby impart rotation to the member in response to the magnetic field, the rotating member stirring the contents of the cuvette.

4,131,371

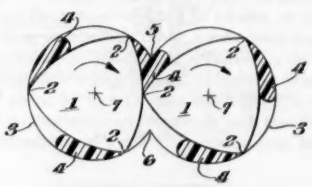
CO-ROTATING MULTIPLE SCREW PROCESSOR

Daniel G. Tynan, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 3, 1977, Ser. No. 822,999

Int. Cl.[2] B01F *7/00*

U.S. Cl. 366—301 **7 Claims**



1. A screw material processor embodying a housing, a multiplicity of parallel, intersecting, cylindrical bores in said housing and a multiplicity of fully intermeshed co-rotating in-phase screws, each operating in one of said bores, each screw being provided with equal numbers of threads, said threads comprising at least a first thread cut along a first helix in sliding contact with the bore of the processor housing with longitudinal axis coincident with the axis of rotation of said screw and at least one additional thread of reduced crest radius as compared with said first thread cut along a helical course concentric with said axis of rotation, said screws having longitudinally staged eccentric cross-sections the geometric centers of which lie on a helical curve having its central axis concentric with said axis of rotation, the amplitude of said helical curve being preselected to provide clearance of said additional thread with respect to said processor bore for spreading process material.

4,131,372

ENDLESS FABRIC RIBBON CASSETTE FOR TYPEWRITERS OR LIKE MACHINES

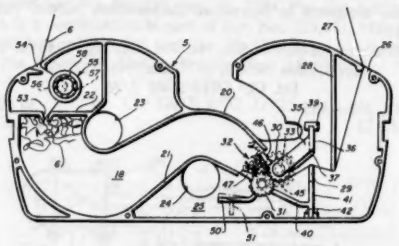
Hans Hengelhaupt, Nuremberg, Fed. Rep. of Germany, assignor to Triumph Werke Nurnberg A.G., Nuremberg, Fed. Rep. of Germany

Filed Apr. 22, 1977, Ser. No. 789,966

Claims priority, application Fed. Rep. of Germany, Apr. 27, 1976, 2618379

Int. Cl.[2] B41J *33/10*

U.S. Cl. 400—196.1 **4 Claims**



1. In combination with a unidirectional ribbon transport mechanism having a train of gears, the last gear on said train of gears serving to wind up a carbon ribbon in a carbon ribbon cassette,

a fabric ribbon cassette having a bottom wall, side walls and a removable cover,

exit and entry openings in the side walls of said cassette, a chamber having inlet and outlet openings in said cassette,

an endless fabric ribbon randomly folded in said chamber and extending therefrom externally of said cassette between said exit and entry openings,

a drive and driven feed roller,

means supporting said drive and driven rollers for rotation in said cassette at the inlet end of said chamber whereby rotation of said feed rollers pulls ribbon from the outlet side of said chamber and from said exit to said entry openings and folds ribbon into the entry side of said chamber,

said means supporting said driven feed roller comprising a flexible arm mounted in said cassette which in unflexed state holds the driven roller in loose engagement with the drive roller

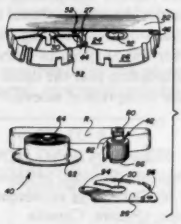
means acting on said flexible arm to flex said arm and to bias said driven feed roller into meshing engagement with said drive roller upon assembly of the cassette cover to the cassette, and

an external gear secured to said drive roller for driving engagement with an intermediate one of the gears in said train of carbon ribbon feed gears when said fabric ribbon cassette is loaded on said transport mechanism.

4,131,373
TYPEWRITER RIBBON CARTRIDGE

Donald E. Rakow, Rockwall, Tex., assignor to Liquid Paper Corporation, Dallas, Tex.

Filed Jun. 10, 1977, Ser. No. 805,348
Int. Cl.[2] B41J *33/14*
U.S. Cl. 400—208 9 Claims

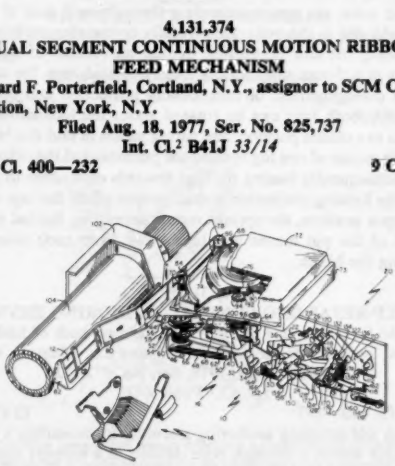


1. A typewriter ribbon cartridge comprising:
an upper wall member,
side walls extending downwardly from said upper wall member forming an area between the side walls and upper wall member,
a ribbon takeup spindle having one end rotatively supported by said upper wall member,
a cover attached to the side walls opposite said upper wall member and rotatively supporting the end of said ribbon takeup spindle opposite said upper wall member, said cover closing only a portion of the area beneath said upper wall member and said portion being adjacent said ribbon takeup spindle,
a ribbon supply spool including a supply spool shaft and a ribbon supply spool platform attached to one end of said supply spool shaft, and
means for rotatively supporting the end of said ribbon supply spool shaft opposite said ribbon supply spool platform from said upper wall member with said ribbon supply spool platform positioned beneath said upper wall member to substantially cover the area below said upper wall member not covered by said cover.

4,131,374
DUAL SEGMENT CONTINUOUS MOTION RIBBON FEED MECHANISM

Richard F. Porterfield, Cortland, N.Y., assignor to SCM Corporation, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,737
Int. Cl.[2] B41J *33/14*
U.S. Cl. 400—232 9 Claims

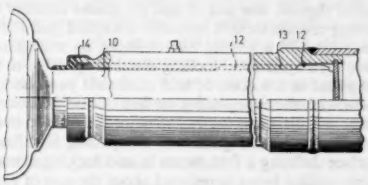


1. A ribbon feed mechanism having a ribbon engaging means and a member operatively connected to the ribbon engaging means for driving the ribbon engaging means for incrementally feeding ribbon, the improvement comprising:
a first drive means including a power source operatively connected to the member for driving the member to advance the ribbon an initial segment of the feed increment; and
a second drive means operatively connected to the member for driving the member to advance the ribbon a final segment of the feed increment with a continuous motion from the initial segment and upon disengagement of the first drive means from the power source.

4,131,375
SPLINED JOINTS

Leslie G. Fisher, Birmingham, England, assignor to Guest, Keen & Nettlefolds, Limited, Warley, England

Filed Aug. 30, 1977, Ser. No. 829,150
Claims priority, application United Kingdom, Sep. 4, 1976, 36748/76
Int. Cl.[2] F16D *1/06*
U.S. Cl. 403—13 4 Claims

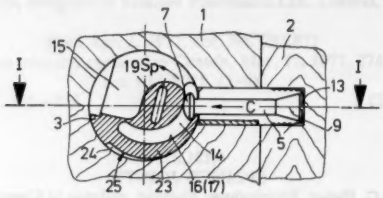


1. A splined joint between a shaft having a plurality of axially extending radially outwardly projecting teeth spaced apart angularly about the rotational axis of the shaft and a muff having a plurality of axially extending radially inwardly projecting teeth spaced apart angularly about the rotational axis of the muff, the teeth of each member fitting between the teeth of the other member to permit relative axial sliding movement and torque transmission between the members, the improvement wherein:
a. said muff defines an internal chamber adjacent to its end from which the shaft projects,
b. a guide ring is disposed in said chamber, the guide ring being of dimensions to exert constraint upon relative radial movement between the shaft and muff,
c. said chamber in the muff is provided with a plurality of angularly spaced radially inwardly extending projections which engage the outer surface of the guide ring,
d. said projections are aligned with respective teeth of the muff but project radially inwardly to a smaller extent than the teeth of the muff,
e. said guide ring having radially outwardly extending projections for engaging in the grooves left between the projections of the muff when the guide ring is first introduced into said chamber,
f. said guide ring is made of a material which can be sheared in response to rotation of the ring relative to the muff so that the inner faces of the projections of the muff are brought into contact with newly exposed circumferential face portions of the ring produced by the said shearing of the projections upon rotation of the ring, and
g. said chamber and guide ring are provided with respective formations which cooperate to prevent axial displacement of the guide ring from the open end of the chamber.

4,131,376
FITTING FOR DETACHABLE CONNECTING STRUCTURAL PARTS

Peter Busse, Vlotho, Germany, assignor to Richard Heinze, Germany

Filed Mar. 10, 1977, Ser. No. 776,428
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1976, 2610200; Jun. 4, 1976, 2625182
Int. Cl.[2] F16B *12/20*
U.S. Cl. 403—12 15 Claims

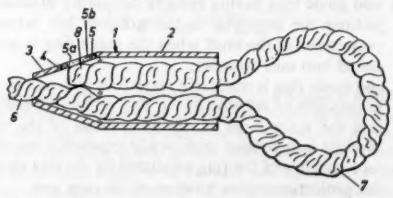


1. A fitting for detachably connecting two abutting structural parts, said fitting comprising (a) a connecting member operable for insertion in a bore hole of a first of said structural parts, said connecting member comprising an expandable sleeve and a bolt-shaped expansion member, said bolt-shaped expansion member being disposed in said sleeve for axial displacement therein, one end of said expansion member defining a widening conical section operable to expand said sleeve upon displacement and a second end defining an engagement surface; and (b) a cylindrical locking element operable to be rotatably disposed in a second of said structural parts and to communicate with the engagement surface of said expansion member when said first and second structural parts are in abutting relationship, said locking element comprising (i) a first eccentric surface defining a first recess in said locking element, said eccentric surface being developed about the axis of rotation of said locking element and being operable to engage the engagement surface on said bolt-shaped expansion member at the point on said surface at maximal radial distance from the axis of rotation and upon rotation of said locking element in a first direction, to effect displacement of said bolt-shaped expansion member relative to said first structural part, and (ii) an abutment surface operable to restrain said expandable sleeve, the distance between said eccentric surface and the axis of rotation decreasing and the distance between said eccentric surface and said abutment surface increasing upon rotation of said locking member in said first direction.

4,131,377
CABLE JOINT AND METHOD OF MAKING SAME

Gerhard Rohland, Ruvigliana-Lugano, Switzerland, assignor to Gerro Gerhard Rohland AB, Vastra Frolunda, Sweden

Filed Nov. 8, 1977, Ser. No. 849,596
Claims priority, application Switzerland, Nov. 9, 1976, 014110/76
Int. Cl.[2] F16G *11/02*
U.S. Cl. 403—14 8 Claims

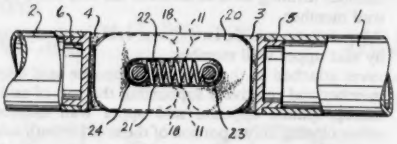


1. In a cable joint having an inspection hole, the cable joint being of the kind comprising a clamping sleeve of deformable material, the clamping sleeve being provided with an end portion and being arranged, when compressed, to lock a cable end section which has been passed through the sleeve and positioned in a loop, with the cable end passed back into the sleeve, the clamping sleeve being further provided with an opening therethrough intermediate the ends thereof which is located adjacent the cable end so that it is visible through the opening, the improvement comprising an insert made from a material that is harder than the material of the clamping sleeve and is placed in said opening during the compression of the clamping sleeve for the purpose of preventing uncontrollable material flow and insuring that the cable end is visible through said opening in the compressed sleeve.

4,131,378
SELF-LOCKING HINGE

Lee F. Daws, Kingston, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada

Filed Jan. 9, 1978, Ser. No. 867,836
Claims priority, application Canada, Jan. 11, 1977, 269457
Int. Cl.[2] F16C *11/10*
U.S. Cl. 403—93 5 Claims



1. A self-locking hinge for interconnecting two relatively foldable structural elements comprising a pair of lugs for connection to the elements in opposed end-to-end relationship, the opposed ends of each lug having a pair of arms with a recess therebetween, at least one arm on one lug having a locking projection, at least one arm on the other lug having a locking groove for receiving said projection to lock said lugs in an open position; a yoke extending from between the pair of arms of one lug to between the arms of the other lug; at least one slot in said yoke, pin means extending through each pair of arms and said slot in the yoke for pivotally connecting each lug to the yoke; the slot permitting limited movement of said pin means in a direction generally axially of said lugs, for consequent disengagement of said locking projection and groove, whereby both lugs can be rotated about the axis of the pin means to a closed position; and spring means in said slot biasing the pin means of one lug toward the pin means of the other lug, and consequently biasing the lugs towards each other to maintain the locking projection in said groove when the lugs are in the open position, the springs means permitting limited movement of the pin means and lugs away from each other for closing the hinge.

4,131,379
SELF-RETAINING CONDUIT ANCHORING DEVICE

Donald G. Gordy, and David P. Klosterman, both of Moberly, Mo., assignors to Orscheln Lever Sales Co., Moberly, Mo.

Filed Jan. 27, 1978, Ser. No. 872,912
Int. Cl.[2] F16B *9/00*
U.S. Cl. 403—197 13 Claims

1. A self-retaining anchoring assembly for mounting a coaxial cable within a through bore defined in a support member, said coaxial cable including concentrically arranged inner and outer members, comprising

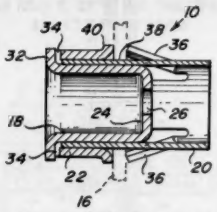
(a) an inner sleeve member having at one end radially outwardly extending first abutment means, said inner sleeve member including adjacent its other end internal stop means arranged for engagement by the extremity of the outer cable member when said cable member is intro-

duced axially into said inner sleeve member from said one end thereof with the inner cable member projecting from the other end thereof;

(b) an outer sleeve member mounted concentrically about said inner sleeve member, said outer sleeve member being in abutting engagement at one end with said inner sleeve first abutment means, said outer sleeve member including adjacent said one end radially outwardly extending second abutment means; and

(c) an annular collar member arranged concentrically about said outer sleeve member and in abutting engagement at one end with said outer sleeve second abutment means;

(d) said outer sleeve member including adjacent its other end a plurality of integral, circumferentially spaced external



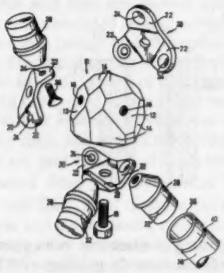
resiliently outwardly biased prong portions that extend at one end in the direction of the said outer sleeve member one end, the extremities of said prongs being spaced from the other end of said collar member a distance equal to the thickness of said support member, whereby when the end of the anchoring assembly adjacent the said other end of said outer sleeve member is progressively introduced within the support bore to a position in which the other end of said collar member is in engagement with one face of the support member, the extremities of the prong members, following inward compression during insertion of the outer sleeve member within the support bore, are resiliently expanded outwardly to positions in which the prong extremities are in engagement with the opposite face of the support member, thereby to prevent axial displacement of the anchoring assembly relative to the support member.

4,131,380

SHAFT END COUPLING MEANS

Michael C. De Bliquy, P.O. Box 69732, Bryanston 2021, South Africa

Filed Aug. 3, 1977, Ser. No. 821,488
Int. Cl.[2] F16D *1/00*
U.S. Cl. 403—217 **10 Claims**



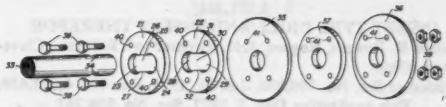
1. Coupling means for use in erecting a framework structure, which includes a node having on its outer surface a plurality of primary faces disposed in a predetermined arrangement and secondary faces associated with the primary faces, each secondary face being arranged to occupy the same position relative to a primary face as other secondary faces occupy relative to their associated primary faces; and at least one retaining member having holding means for holding it on a primary face of the node, the retaining member having at least one ear locatable on a secondary face associated with the primary face on which the retaining member is locatable, the ear having a locating formation to permit location of the end of a cross member or a connector for a cross member in a load supporting position against a secondary face of the node.

4,131,381

MEANS AND METHOD FOR MOUNTING A STRUCTURE ON A SHAFT

Albert K. Alberts, 1084 Canyon Crest Dr., Bountiful, Utah 84010

Filed Nov. 21, 1977, Ser. No. 853,117
Int. Cl.[2] B25G *3/00*
U.S. Cl. 403—353 **9 Claims**



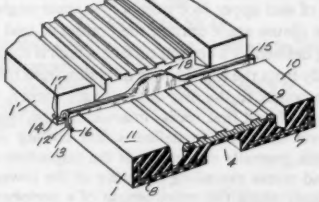
1. A mechanical assembly for mounting on a shaft that has transverse grooves in respective diametrically opposite sides thereof intermediate its length, said grooves providing substantially rectilinear slideways, the assembly comprising a structure to be secured to the shaft for rotation therewith, said structure having a close-fitting opening for freely receiving the shaft; a securement plate having an opening with a main portion adapted to receive the shaft and with an auxiliary portion extended laterally from said main opening and defined by mutually opposite rail formations for snugly receiving the grooved portion of the shaft when such grooved portion and said plate are in lateral registry; and means for securely fastening the securement plate to said structure when said plate is positioned on said shaft with its rail formations in mating relationship with said grooves of the shaft.

4,131,382

EXPANSION JOINTS

Lawrence A. Hymo, 9414 Macklin Ct., Alexandria, Va. 22310

Filed Dec. 14, 1977, Ser. No. 860,574
Int. Cl.[2] E01C *11/10*
U.S. Cl. 404—69 **6 Claims**



2. In a roadway expansion joint comprising a first and second adjoining pavement section, spaced from each other to provide a gap therebetween, each said pavement section having a blockout adjacent said gap, said blockout opening upwardly and toward said gap to receive an expansion joint,

a rubber cushion expansion joint comprising a plurality of elongated units,

each said unit comprising first and second elongated rubber cushions, each said rubber cushion having a top surface, a bottom surface, an outer surface and end surfaces, said rubber cushion units being secured respectively in said blockouts on opposite sides of said gap so that the top surfaces of said rubber cushions form part of the roadway surfaces, and means connecting said rubber cushions, said connecting means forming a watertight connection between said rubber cushions and allowing movement of

said rubber cushions toward and away from each other to accommodate opening and closing of said gap,

said plurality of units being secured in said blockouts in end-to-end relationship along the length of said expansion joint,

and end-to-end connecting means which connect the ends of adjoining units along said expansion joint;

the improvement wherein said rubber cushions have a longitudinally-extending groove in their bottom or outer surfaces and including a flexible sealing member in said groove and extending outwardly into contact with said blockout to seal against leakage of water.

4,131,383

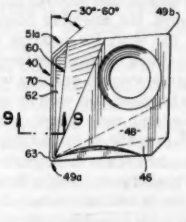
INSERT TYPE DRILL AND INSERT THEREFOR

Thomas R. Powers, Rogers, Ark., assignor to TRW Inc., Cleveland, Ohio

Division of Ser. No. 708,836, Jul. 26, 1976, Pat. No. 4,072,438. This application Dec. 7, 1977, Ser. No. 858,262

Int. Cl.[2] B26D *11/00*

U.S. Cl. 407—114 **5 Claims**



1. A cutting inset for use in a drill of the type described comprising:

a solid unitary body having opposed, parallel, upper and lower faces each in the shape of a parallelogram having a pair of opposed acute angle corners;

peripheral side walls joining said upper and lower faces and extending generally perpendicular thereto;

a first recess extending inwardly of said body from the upper face continuously along the entire length of a peripheral edge of said upper face from a first acute angle corner to a first obtuse angle corner, the bottom of said first recess being defined by a bottom surface which is inclined downwardly from the top face in a direction from the first acute angle corner to the first obtuse angle corner, the bottom surface of said first recess intersecting the respective peripheral side wall to define a first cutting edge which extends generally diagonally of the respective side wall; a second recess extending inwardly of the lower face continuously along the entire length of a peripheral edge of the lower face from said first acute angle corner to the second obtuse angle corner, the bottom of said second recess being defined by a bottom surface which is inclined downwardly from the lower face in a direction from the first acute corner to the second obtuse corner, the bottom surface of said second recess intersecting the respective peripheral side wall to define a second cutting edge which extends generally diagonally of the respective side wall, each obtuse angle corner being chamfered to provide each said first and second cutting edges with a short end portion that lies in the plane of said respective cutting edge but is inclined relative thereto; and,

the peripheral side wall portions under each said chamfered corner being inclined in a direction inwardly of the insert body relative to the associated cutting edge end portion to provide cutting clearance for drilling operations.

4,131,384

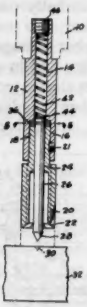
ARBOR FOR ANNULAR HOLE CUTTER

Everett D. Hougen, G-5072 Corunna Rd., Flint, Mich. 48504

Filed Sep. 8, 1977, Ser. No. 831,363

Int. Cl.[2] B23B *47/00, 51/00*

U.S. Cl. 408—68 **12 Claims**



1. An arbor for an annular hole cutter comprising a shank having means at its upper end for connection with a rotary driven spindle, the lower end of said arbor being adapted for mounting an annular hole cutter thereon, said shank having an axial bore therein which opens through the lower end of said shank, a pilot pin axially slideable in said bore, said pin being insertable into said bore and being adapted to be withdrawn therefrom through said open end of said bore, a compression spring in said bore acting on the upper end portion of said pin and yieldably biasing the pin downwardly in said bore to a position wherein the leading end of the pin extends axially beyond the leading end of an annular cutter on said arbor, and means independent of said spring fixed axially in said bore and resiliently engaging said pin adjacent its upper end when in said biased position and applying a radial force thereto to frictionally retain the pin in said bore, said resilient means comprising the sole means for retaining the pin in said bore.

4,131,385

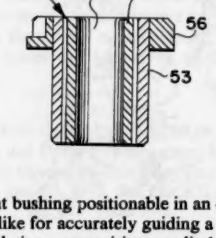
ALIGNMENT BUSHING

Rajendra K. Narang, 1525 Bonnie Rd., Macedonia, Ohio 44056

Filed Nov. 3, 1975, Ser. No. 628,397

Int. Cl.[2] B23B *39/00, 47/00;* **B23G** *1/00*

U.S. Cl. 408—241 B **7 Claims**



1. An alignment bushing positionable in an opening through a jig plate or the like for accurately guiding a tool through the jig plate to a workpiece, comprising a cylindrical guide member insertable in the jig plate opening and having a substantially uniform, cylindrical central passage therethrough for guiding the tool to the workpiece and a substantially uniform, cylindrical exterior surface and holding means concentric about at least a part of said guide member and temporarily selectively coupled thereto at any location along the guide member required to attach the guide member to the jig plate for accurate guiding of the tool to the workpiece, said guide

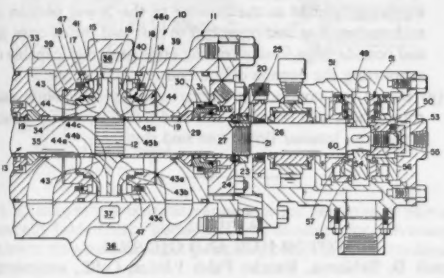
member being removable from and reversibly positionable in said holding means, whereby the guide member may selectively be reversed after wearing of one end thereafter to present the uniform end of the passage to the tool for guidance purposes, and said holding means being coextensive with the longitudinal extent of said guide member, whereby said guide member forms an insert within a cylindrical passage in said holding means.

4,131,386

SEALING SYSTEM FOR CENTRIFUGAL PUMP

William J. Mabe, Jr., Thornton, Colo., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 5, 1977, Ser. No. 794,170
Int. Cl.[2] F01B *11/08*
U.S. Cl. 415—98 **2 Claims**



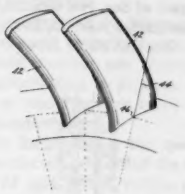
1. In a double suction, high-speed, centrifugal pump including a housing, a shaft journaled for rotation within said housing, an impeller chamber located within said housing, inlet and outlet means for said chamber, an impeller body fixed to said shaft within said chamber, first and second sets of impeller blades fixed to opposite sides of said body for rotation with said shaft to pump fluid from said inlet means to said outlet means, first and second shrouds integrally formed with said first and second sets of blades, respectively, and first and second sealing rings associated with said first and second shrouds, respectively, said rings being mounted within said chamber and held against rotation with said impeller, the improvement comprising a first set of two sealing surfaces on said first shroud, said surfaces in said first set being spaced axially from each other and extending in a radial direction and facing in a first axial direction, a second similar set of sealing surfaces on said second shroud facing in the opposite axial direction, first and second sets of sealing walls on said first and second sealing rings and associated with said first and second sets of sealing surfaces respectively, said associated sealing surfaces and walls extending parallel to and facing each other and being spaced from each other a fixed axial distance, a cylindrical surface formed in each of said shrouds in each of said sets concentric with said shaft and being connected between said two sealing surfaces of said sets, an axially extending cylindrical wall formed in each of said sealing rings and connected between said two sealing walls in each set, said cylindrical walls normally being spaced radially outward from said cylindrical surfaces a distance greater than said fixed axial distance between said associated sealing surfaces and sealing walls, means associated with one of said sealing rings for precisely adjusting the axial distance between said first and second sets of sealing walls, and adjustable means connectable between said shaft and said housing for precisely locating said impeller within said chamber when assembling said pump so that the axial distance between said first set of sealing surfaces and said first set of sealing walls is substantially the same as the axial distance between said second set of sealing surfaces and said second set of sealing walls to keep fluid from leaking substantially from said outlet means to said inlet means by flowing between said sealing surfaces and walls.

4,131,387

CURVED BLADE TURBOMACHINERY NOISE REDUCTION

Stephen B. Kazin, West Chester, and Ram K. Matta, Cincinnati, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Feb. 27, 1976, Ser. No. 662,150
Int. Cl.[2] F01D *5/12*
U.S. Cl. 415—119 **2 Claims**



1. In an aircraft gas turbine engine turbomachinery stage comprising adjacent upstream and downstream blade rows, one of which is rotatable, the improvement wherein the blades of the upstream row are physically curved with a local physical radial lean distribution in the circumferential direction such that the sum of the physical lean and the inherent aerodynamic lean in the circumferential direction results in the integrated acoustic power, P_w, of the bladed stage being essentially at a minimum at the flight approach power operating condition where P_w is generally defined by the relationship:

$$P_w = 2\pi \int_{r_{hub}}^{r_{tip}} \frac{P_m^2}{\rho c} r dr, \text{ where:}$$

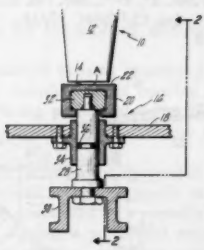
r_{hub} = upstream blade row hub radius;
r_{tip} = upstream blade row tip radius;
P_m = RMS acoustic pressure;
ρ = motive fluid density;
c = acoustic velocity (speed of sound);
r = radius; and
dr = incremental radius.

4,131,388

OUTER AIR SEAL

Robert F. Brodell, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 26, 1977, Ser. No. 800,979
Int. Cl.[2] F01D *11/08, 25/24;* F02C *7/20*
U.S. Cl. 415—138 **9 Claims**



1. For a gas turbine engine having an engine case, a segmented, outer air seal of the type adapted to circumscribe the tips of the rotor blades, wherein the improvement comprises:
a continuous ring positioned externally of the engine case for radially positioning the outer air seal, wherein said radial

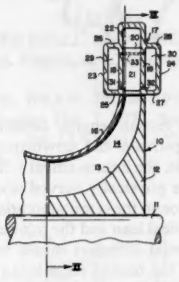
position is determined by a substantially fixed position of the continuous ring.

4,131,389

CENTRIFUGAL COMPRESSOR WITH IMPROVED RANGE

George L. Perrone; Robert W. Boorman, both of Phoenix; Michael R. Holbrook, Glendale, and Eugene A. Zanelli, Scottsdale, all of Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 636,255, Nov. 28, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 790,718
Int. Cl.[2] F04D *29/44*
U.S. Cl. 415—211 13 Claims



1. In a compressor of the type having a centrifugal impeller and a diffuser at the periphery thereof, the diffuser including spaced sidewalls and spaced vanes extending therebetween, the spaces between the vanes having inlet ends adjacent the periphery of said impeller, the improvement comprising:

means in connection with said diffuser forming a plenum; and

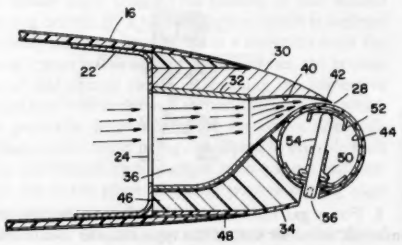
passage-forming means establishing communication between the inlet ends of the spaces between the diffuser vanes and said plenum to equalize the pressure in the inlet ends of all such spaces during the operation of the compressor, said passage-forming means extending along a substantially constant static pressure line across each of said spaces and said plenum being otherwise closed to minimize fluid flow from said plenum through said passage-forming means.

4,131,390

CIRCULATION CONTROLLED ROTOR BLADE

Jacob Schmidt, deceased, late of Van Nuys, Calif. (by Mia H. Schmidt, administratrix), assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 27, 1977, Ser. No. 810,539
Int. Cl.[2] B64C *27/18*
U.S. Cl. 416—20 R 13 Claims



1. A circulation controlled rotor blade comprising:

(a) a skin folded to form a sandwich, the fold of said sandwich being the leading edge of said rotor blade;

(b) a spanner within said sandwich and attached to said skin to provide structural support;

(c) a rear spar within and attached to said sandwich near the open end opposite the fold, said rear spar having a plurality of holes therethrough;

(d) a fluted core having a plurality of openings with thin sidewalls, said openings being aligned with said rear spar;

(e) a lip bonded to the upper surface of said fluted core and to the underside of the upper portion of said sandwich at said open end;

(f) a coanda edge having a flexible spanwise tube and a leg integral with said tube to provide stiffening, the upper surface of said leg being bonded to the bottom of said fluted core such that said tube is in juxtaposition with said lip to form a spanwise slot, and the lower surface of said leg being bonded to the interior of the lower portion of said sandwich at said open end so that said fluted core, lip and coanda edge form a trailing edge assembly capable of supporting the coanda effect; and

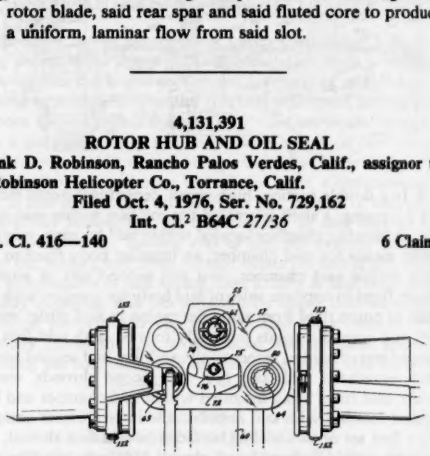
(g) means for conducting compressed fluid through said rotor blade, said rear spar and said fluted core to produce a uniform, laminar flow from said slot.

4,131,391

ROTOR HUB AND OIL SEAL

Frank D. Robinson, Rancho Palos Verdes, Calif., assignor to Robinson Helicopter Co., Torrance, Calif.

Filed Oct. 4, 1976, Ser. No. 729,162
Int. Cl.[2] B64C *27/36*
U.S. Cl. 416—140 6 Claims



1. An underslung rotor structure for a rotorcraft having two rotor blades driven by a rotor shaft, comprising:

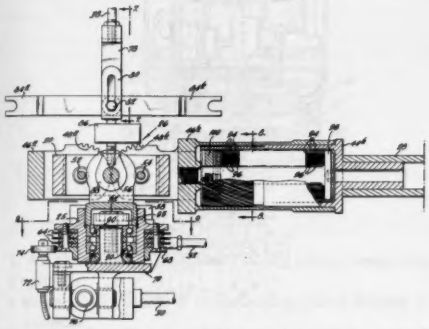
a hub mounted on the rotor shaft for rotation by it and including a teeter hinge having a hinge axis passing perpendicularly through the axis of the rotor shaft to provide tilting movement of said hub relative to the rotor shaft about the axis of said teeter hinge, and further including two coning hinges having axes parallel to the axis of the teeter hinge but located below it and offset from the axis of the rotor shaft for mounting the rotor blades to the hub so as to provide independent substantially unopposed coning movement of each rotor blade relative to said hub so as to balance the aerodynamic forces on each blade with the centrifugal forces on each blade, whereby stick shake is substantially eliminatcd; and,

a friction teeter hinge restraint including an arm on each rotor blade extending inwardly of each coning hinge and having an upper surface curved so as to lie at a substantially constant distance from said teeter hinge axis when the rotor blades are at rest, and a droop stop extending from the rotor shaft to engage said upper surface so that when the rotor blades are at rest teetering of said hub is yieldably opposed by friction between said droop stop and said upper surface and so that when said rotor blades are driven said droop stop is spaced from said upper surface permitting the rotor blades to tilt and cone freely.

4,131,392
DEPLOYABLE ROTOR

Justin J. Barzda, Windsor, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 664,714, Mar. 8, 1976, Pat. No. 4,017,043.
This application Jan. 31, 1977, Ser. No. 764,485
Int. Cl.[2] B64C *11/28, 27/50*
U.S. Cl. 416—142 4 Claims



1. Coning synchronization apparatus for deploying a pair of parallelly folded rotor blades pivotally mounted for movement between stowed and flight positions, comprisng, in combination:

a rotor hub for rotating about a first axis;

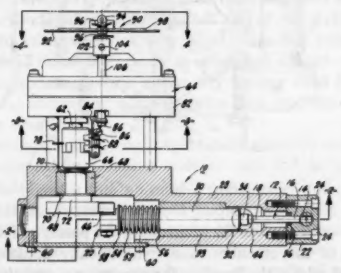
teeter means hingingly connected to said hub about a second axis perpendicular to said first axis for teetering on the second axis about said hub; and

sector means formed to be connected to said blades at respective rotor ends thereof and pivotally mounted to said teeter means for maintaining concomitant spreading of said blades to a predetermined position intermediate of the stowed and flight positions, and independent spreading between the predetermined and flight positions, said sector meas comprising a pair of opposed arcuate surfaces intermeshing between the stowed and predetermined positions of said blades, and spaced apart from each other between the predetermined and flight positions of said blades.

4,131,393
FLUID PUMP MECHANISM

Haakon T. Magnussen, Jr., Pinole, Calif., assignor to Altex Scientific, Inc., Berkeley, Calif.

Filed Jan. 21, 1977, Ser. No. 761,433
Int. Cl.[2] F04B *49/00*
U.S. Cl. 417—22 27 Claims



1. A fluid pump mechanism for delivering fluid against a back pressure comprising:

a. piston, at least a portion of which is reciprocative within a chamber having a fluid inlet and fluid outlet said piston having a first end portion and a second end portion, said first end portion contacting the fluid, said piston being capable of filling and emptying said chamber;

b. motive means for reciprocating said piston within said chamber at a selected substantially constant speed, said substantially constant speed determined by constant speed setting means for setting said motive means at a substantially constant speed, said motive means at a substantially constant speed, said motive means contacting said second end portion of said piston;

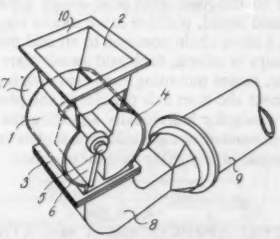
c. valve means for permitting the filling and emptying of said chamber coordinated with the pressure exerted by said piston within said chamber; said piston, motive means and valve means cooperating to produce a time duration of fluid flow from said chamber ralative to said selected substantially constant speed;

d. control means for changing the speed of said motive means at a preselected portion of the time period of said reciprocation of said piston within said chamber, said control means including detection means for detecting and signaling the inception of the chamber filling stroke of said piston and the termination of said chamber filling stroke of said piston; filling means for changing said constant speed of said motive means at the inception of the chamber filling stroke of said piston and returning said motive means to said constant speed at the termination of said chamber filling stroke of said piston said filling means being activated and deactivated by said detection means signal.

4,131,394
METHOD FOR TRANSPORT OF MANURE AND A DEVICE ACCORDING TO THE METHOD

Bror A. Sjöblom, Gottne, Moliden, Sweden (S-890 26)

Continuation of Ser. No. 631,125, Nov. 11, 1975, abandoned.
This application Apr. 13, 1977, Ser. No. 787,499
Claims priority, application Sweden, Jan. 23, 1976, 7414262
Int. Cl.[2] F04C *21/00*; F04B *15/02*
U.S. Cl. 417—481 4 Claims



1. An apparatus for transporting manure under pressure comprising:

a generally cylindrical housing presenting a generally upwardly facing peripheral inlet opening and a generally downwardly facing peripheral outlet opening said inlet and outlet openings being separated by a first peripheral distance;

elongate, rotatable piston means disposed in said housing and presenting first and second generally radially extending driving surfaces connected by a partially generally cylindrical surface having a peripheral extent sufficient to block said inlet opening, said first and second driving surfaces being separated by a second peripheral distance greater than the first peripheral distance between said inlet and outlet openings;

drive means for rotating said piston means in both angular directions about a generally central axis of said housing; and

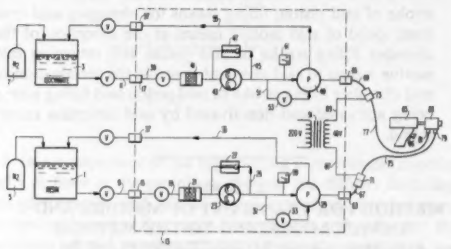
elongate, movable valve means, mounted in said housing for pivotal movement about said generally central axis of said housing to project solely generally radially downwardly from said generally central axis into said outlet opening, and movable between first and second circumferentially spaced positions engaging said housing at opposed junctures with said outlet opening, said valve means cooperating with the driving surfaces of the piston means to urge the manure downwardly through the outlet opening with the driving surfaces of the piston means coming into close proximity with the valve means when the piston is at its lowermost travel about the central axis.

4,131,395

FEEDER FOR APPARATUS FOR EJECTING A MIXTURE OF A PLURALITY OF LIQUIDS

Frederick E. Gusmer; Denis S. Commette, both of Mantoloking, and Robert A. Bairunas, Bordentown, all of N.J., assignors to Gusmer Corporation, Old Bridge, N.J.

Filed Sep. 29, 1976, Ser. No. 727,981
Int. Cl.[2] F04B *1/12, 23/10*
U.S. Cl. 417—271 **6 Claims**



1. A feeder for apparatus for ejecting a mixture of a plurality of liquids, the feeder comprising a plurality of swash plate pumps one individual to each said liquid, a further pump individual to each said swash plate pump for feeding a respective said liquid to the associated said swash plate pump from a supply of said liquid, positive drive means comprising a drive motor and a drive chain common to all said pumps for driving all said pumps in unison, each said swash plate pump having a swash plate, means mounting each said swash plate for swinging movement about an axis parallel to the plane of the swash plate, and means for individually adjusting the amount of said swinging movement of each said swash plate independently of the adjustment of any other said swash plate.

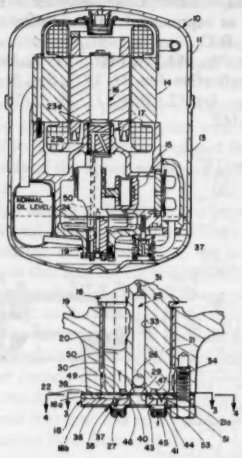
4,131,396

HERMETIC COMPRESSOR LUBRICATION SYSTEM WITH TWO-STAGE OIL PUMP

George T. Privon, and Andrew W. Paczuski, both of Bristol, Tenn., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Apr. 7, 1977, Ser. No. 785,712
Int. Cl.[2] F04B *17/00;* **F01M** *1/00, 9/00, 1/10*
U.S. Cl. 417—372 **25 Claims**

1. In a hermetic compressor including, a hermetically sealed housing, an electric motor mounted within said housing, a driven shaft connected to and depending from said motor and having a lower end portion immersed in a sump of lubricant in the housing, bearing surfaces supporting said shaft within said housing, means supported within said housing and drivingly connected with said shaft to be driven by said motor for compressing refrigerant gases from within said housing, the improvement in said compressor comprising, a lubrication system for supplying lubricant to said bearing surfaces including, first and second stage pumps located within said lower end portion of said shaft, an inlet to said first stage pump communicating with the sump, said inlet for said first stage pump is coincident with the rotational axis of said shaft, and a vent for refrigerant gases communicating directly with said inlet and extending through said shaft concentrically along the axis thereof for at



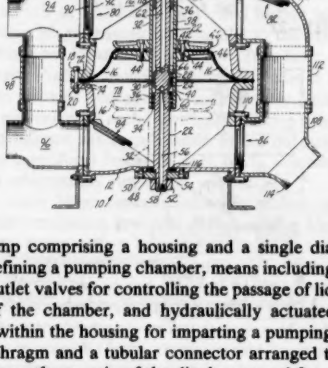
least for some distance above said first stage pump for directing flashed refrigerant gases away from said first stage and back to the interior of said housing above said sump.

4,131,397

PUMPS

Jerome H. Milgram, Cambridge, Mass.; Vance S. Bartoo, Somerville, N.J., and Burdett H. O'Connor, Marblehead, Mass., assignors to Offshore Devices Inc., Peabody, Mass.

Filed Apr. 14, 1977, Ser. No. 787,383
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—404 **8 Claims**



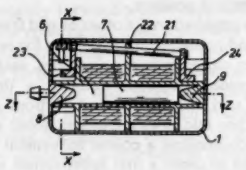
1. A pump comprising a housing and a single diaphragm together defining a pumping chamber, means including a set of inlet and outlet valves for controlling the passage of liquid into and out of the chamber, and hydraulically actuated means contained within the housing for imparting a pumping motion to the diaphragm and a tubular connector arranged to clamp the housing on the margin of the diaphragm and formed with a conduit for supplying hydraulic fluid to the hydraulically actuated means.

4,131,398

GLASS WASHING ELECTROMAGNETIC PUMP, MORE PARTICULARLY FOR WINDSCREENS OF MOTOR VEHICLES

Onofrio Rocchitelli, 20, Via Stoppani, Rho, Milan, Italy (20017)

Filed Nov. 17, 1976, Ser. No. 742,701
Claims priority, application Italy, Nov. 24, 1975, 29561 A/75
Int. Cl.[2] F04B *17/04*
U.S. Cl. 417—418 7 Claims



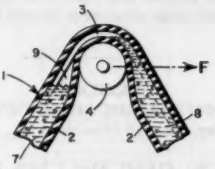
1. An electromagnetic glass washing pump comprising:
a cylinder;
a magnetically sensitive reciprocating piston housed in said cylinder;
two electromagnets positioned around said cylinder so that said electromagnets are at opposing ends of said cylinder;
said electromagnets electrically connected in series;
a switch having two fixed contacts and a central movable contact;
said central movable contact of said switch electrically connected to said electromagnets at said electromagnets' series connection;
said fixed contacts of said switch electrically connected to said electromagnets at the ends remote from said series connection so that one of said fixed contacts is electrically connected to one electromagnet and the other said fixed contact is electrically connected to the other said electromagnet;
said fixed contacts of said switch connected to a D.C. power supply so that one of said fixed contacts is maintained at a higher voltage than the other said fixed contact;
said central movable contact alternately contacting said fixed contacts and electrically shorting the electromagnet connected between said fixed contact and said series connection;
said central movable contact moving between said fixed contacts so that during switching said central movable contact is not contacting either of said fixed contacts allowing current to pass through both electromagnets;
a casing having a fluid inlet and a fluid outlet surrounding said cylinder;
means to selectively introduce fluid from said fluid inlet into said cylinder alternately at either end of said cylinder;
means to selectively discharge fluid from said cylinder to said fluid outlet alternately at either end of said cylinder;
said reciprocating piston alternately forcing fluid from the cylinder at one end while drawing fluid into the cylinder at the other end;
a fulcrummed rod having magnetically sensitive ends;
said magnetically sensitive ends of said rod in magnetic communication with an electromagnetic field induced alternately at each end of said cylinder by said electromagnets so that said rod rocks toward the end of said cylinder which is electromagnetically energized;
said movable contact attached to one end of said fulcrummed rod so that the rocking motion of said fulcrummed rod causes the movable contact to complete a circuit alternately with said fixed contacts to induce the electromagnetic field at the opposite end of said cylinder.

4,131,399

PERISTALTIC TUBE PUMP WITH MEANS PREVENTING COMPLETE OCCLUSION OF TUBE

Gérard Calvet, Ivry-sur-Seine, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Jul. 2, 1976, Ser. No. 702,205
Claims priority, application France, Jul. 8, 1975, 75 21360
Int. Cl.[2] F04B *43/08, 43/12, 45/06*
U.S. Cl. 417—477 13 Claims



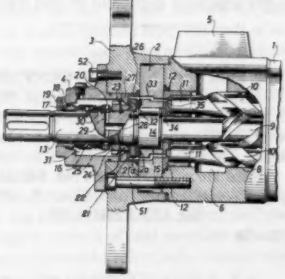
1. In a peristaltic pump assembly, the improvement which comprises a peristaltic tube of flexible material having an inlet end and an outlet end, the wall of the tube being provided with at least one wall surface irregularity rendering the cross-section of the wall of the tube noncircular cylindrical in at least that region on which flat roller tube flattening elements of the peristaltic pump act in flattening the tube against an arcuate backing element to exercise a peristaltic pumping action, the irregularity leading to at least one arcuate reservoir being defined by the inside wall of the tube when the tube is flattened in said region, within which arcuate reservoir gas can collect while liquid is being peristaltically pumped through the tube.

4,131,400

HYDRAULIC ROTARY SCREW MACHINE WITH AXIAL BALANCING PISTON

Lars Segerström, Skarholmen, Sweden, assignor to Aktiebolaget Imo-Industri, Stockholm, Sweden

Filed Apr. 19, 1977, Ser. No. 788,968
Claims priority, application Sweden, Apr. 27, 1976, 7604832
Int. Cl.[2] F04C *17/12, 29/00*
U.S. Cl. 418—203 1 Claim



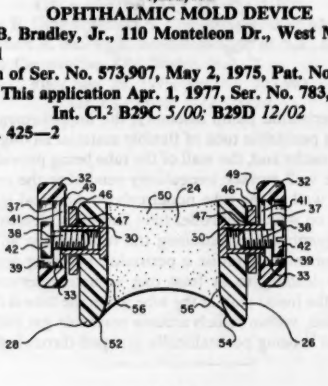
1. A hydraulic screw machine comprising a housing, a drive screw extending axially of the housing; a plurality of idler screws extending axially of the housing and intermeshing with said drive screw; a shaft integral with said drive screw and protruding from one end of said housing; means forming a shaft seal space about said shaft at said end of the housing, said shaft seal space being at a pressure lower than that of a high-pressure side of the machine; a piston formed integral with a shaft of the drive screw, having an outer diameter equal to or smaller than the outer diameter of the drive screw, said piston extending with a close fit through a bore in the housing between the shaft-seal space and said high-pressure side; a plate

of greater diameter than the piston being affixed to said shaft at a side of the piston facing away from said drive screw; a leak passage along the periphery of the piston: said plate having a side facing away from the piston being subjected to pressure prevailing in said shaft seal space and the opposite side of the plate radially outwardly of the piston being subjected to a pressure intermediate the pressure prevailing in said shaft seal space and the pressure at said high-pressure side of said machine; abutment means connected to said housing, facing radially outward portions of sais opposite sides of the plate and being adapted to confine said plate in an axial direction while permitting limited axial movement thereof between said abutment means.

4,131,401
OPHTHALMIC MOLD DEVICE

James B. Bradley, Jr., 110 Monteleon Dr., West Monroe, La. 71291

Division of Ser. No. 573,907, May 2, 1975, Pat. No. 4,032,223.
This application Apr. 1, 1977, Ser. No. 783,946
Int. Cl.[2] B29C 5/00; B29D 12/02
U.S. Cl. 425—2 9 Claims



1. A device utilized for forming a molded impression of a portion of a person's nose, the impression being used to form a nosepiece for the person's eyeglass frames, comprising:

(a) a mold for retaining a predetermined quantity of a molding substance utilized in forming the nose impression;

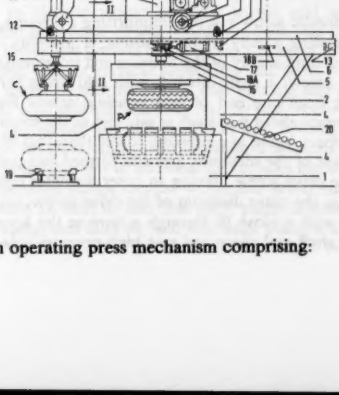
(b) A frame for retaining the mold, said frame being formed generally in a configuration similar to a person's eyeglass frames but without a nosepiece and having a pair of temples hingedly attached thereto; and

(c) means, associated with said mold and said frame, for removably attaching said mold to said frame.

4,131,402
DEVICE FOR THE MUTUAL CENTERING OF RELATIVELY MOVABLE MECHANIC ELEMENTS, PARTICULARLY USED ON TIRE CURING PRESSES

Dante Pirovano, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Nov. 7, 1977, Ser. No. 849,215
Claims priority, application Italy, Nov. 15, 1976, 29324 A/76
Int. Cl.[2] B29H 5/08
U.S. Cl. 425—38 16 Claims



1. An operating press mechanism comprising:

a mold including a first portion fixed to a support device and a second portion adapted to mate with said first portion,

a frame attached to said support device,

a truck movable horizontally on said frame,

a first means coupling said second mold portion to said truck,

means for imparting relative vertical movement between said first and second mold portions for opening and closing said mold,

vise means including a pair of jaws adapted to open and close attached to one of said frame and said truck at a first predetermined position,

a first tooth attached to the other of said frame and said truck at a second predetermined position for engaging with said vise when closed between said jaws, said first and second predetermined positions defining a desired alignment between said first and second portions of said mold obtained when said jaws are closed about said tooth,

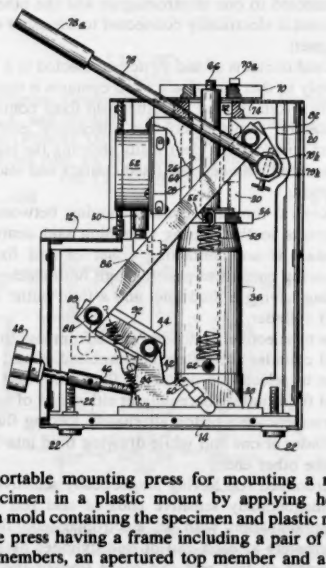
means for controlling a coarse movement of said truck on said frame to cause a first approximate mutual alignment of said vise and said first tooth, and

means for controlling a precise alignment of said first and second portions of said mold, said means for controlling a precise alignment including means for closing said jaws about said first tooth to thereby impart relative movement between said truck and said frame thereby causing said desired alignment between said first and second portions of said mold.

4,131,403
MOUNTING PRESS

Marvin W. Keith, Jr., Evanston, Ill., assignor to Buehler Ltd., Evanston, Ill.

Continuation of Ser. No. 603,102, Aug. 8, 1975, abandoned. This application Sep. 9, 1977, Ser. No. 831,892
Int. Cl.[2] B29C 3/00
U.S. Cl. 425—127 7 Claims



1. In a portable mounting press for mounting a metallographic specimen in a plastic mount by applying heat and pressure to a mold containing the specimen and plastic molding material, the press having a frame including a pair of upright side frame members, an apertured top member and a base, a hydraulic jack positioned upright on the base between the side frame members and having a jack actuator located at the front of the jack adjacent the lower end thereof and pivotally movable about a horizontal actuator pivot axis, a downwardly biased ram plate positioned above the hydraulic jack for upward movement upon actuation of the jack, an upright ram secured to the top of the ram plate and extending upwardly

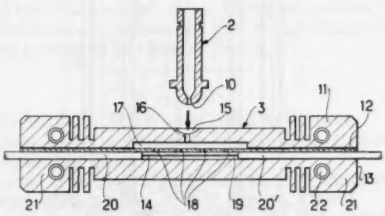
through an aperture in the top member, a mold fixedly mounted to the top member and having a mold bottom closure member carried on the upper end of the ram, whereby actuation of the jack will raise the mold bottom closure within the mold to increase pressure therein, the improvement comprising improved force transmitting means for operating the jack actuator to increase the stability of the press and eliminate the need for bolting the same down, said force transmitting means including, in combination, a horizontal crank shaft extending between said side frame members, said crank shaft being located substantially above said actuator pivot axis and rearwardly thereof and being rotatable about its own axis, a manually operable generally forwardly extending handle secured to said crank shaft for rotating the same, a plurality of force-transmitting links interconnecting said crank shaft with said jack actuator to effect pivotal movement of said actuator by manual pumping of said handle, said links including a first link mounted to said crank shaft for conjoint rotation therewith, said first link having a length less than the length of said jack actuator thereby producing a mechanical advantage facilitating manual movement of said handle, and at least one additional link interconnecting said first link with said actuator.

4,131,404

DEVICE FOR THE PROTECTIVE COVERING OF OPTICAL FIBRES

René Dubost, La Tour du Pin; Francis Gauthier, Oullins, and Georges Mignien, Meyzieu, all of France, assignors to Societe Anonyme Dite: Les Cables de Lyon, Lyons, France

Filed Jul. 19, 1977, Ser. No. 817,528
Claims priority, application France, Jul. 29, 1976, 7623179
Int. Cl.[2] B29F *1/10*
U.S. Cl. 425—129 R **3 Claims**



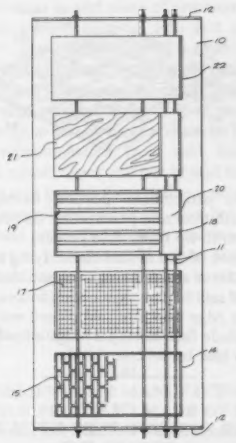
1. An apparatus for forming a protective covering on an optical fibre, by butt welding the ends of two fibres for the purpose of covering a base length of fibre on either side of the butt weld between two covered lengths of fibre, and comprising: a press employing means for transmitting air pressure through a piston in an injection cylinder in working relation thereto, said injection cylinder having means to feed raw moldable material into a mold in alignment therewith, means to close said mold around the base length of said fibre, said mold being defined by three separable parts; a first part for delimiting a distributed-feed chamber on its downward side, facing the fibre and having a cup on its upward side facing the cylinder, with at least one passageway leading from the cup into the chamber; a second part, being a plate with a half-round groove on its downward side facing the fibre and having a plurality of feed holes in two staggered rows along said groove, each row of said holes on either side of a vertical plane passing through the center line of said half-round groove and normal to the horizontal plane passing through said center-line; said passageway being positioned on said center-line, and a third part, with a half-round groove on its upward side complementary to the groove of said second part, to form a cylindrical mold print of the dimensions and geometry of the covering to be formed, said second and third parts having receiving means to position said covered lengths of fibre.

4,131,405

APPARATUS FOR PRODUCING STRUCTURAL PANELS

Richard L. Moore, 764 Humboldt St., Denver, Colo. 80218

Continuation-in-part of Ser. No. 420,390, Nov. 30, 1973, abandoned. This application Apr. 19, 1976, Ser. No. 678,312
Int. Cl.[2] B28B *7/02, 7/22, 7/26*
U.S. Cl. 425—143 **4 Claims**



1. A set of elements for use in simultaneously producing a series of prestressed and reinforced cementitious building panels of substantially rectangular shape with a shallower wall portion and a deeper foundation portion on a casting table, comprising:

a plurality of box-like forming means adapted to be placed in spaced relation to one another on the casting table each box-like forming means including a first form member for the bottom of the panel, a second form member in parallel, spaced relation to said first form member for the top of the panel, and parallel, spaced bulkhead forms for the sides of the panel, said first form member being adapted to be immovably secured to said casting table and being comprised of a plurality of modules removably stacked one on top of another in a plane to form said deeper foundation portion;

stacking means on the outside surface of said first form member in spaced relation from the ends of said first form member for maintaining said modules in stacked relation, said stacking means including a socket permanently affixed on said side of each of said modules in positions such that a socket on each module is in vertical alignment with a socket on a module vertically adjacent thereto, and a stake adapted for insertion through said vertically aligned sockets; and

hinge means on said modules for pivotally connecting said modules one to another, and in which said stacking means are provided on each of said modules whereby the lower of said modules can be selectively stacked while the upper of said modules remain unstacked.

4,131,406

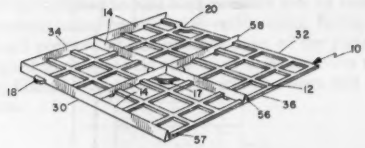
TOOLS FOR MAKING IMPRESSIONS IN HARDENABLE MATERIALS

George A. Fresquez, 4883 Fond du Lac Ct., San Diego, Calif. 92117

Filed Oct. 11, 1977, Ser. No. 840,837
Int. Cl.[2] E04G *11/06;* B28B *11/10*
U.S. Cl. 425—385 **2 Claims**

1. A tool for making impressions in hardenable materials comprising:

blade means comprising a plurality of elongated blades lying substantially in a stamping plane,
a platform grid,
said blade means being secured to said platform grid,
means for pressing said blade means into said hardenable materials,
said blade means having a penetrating tip and a platform attachment portion,



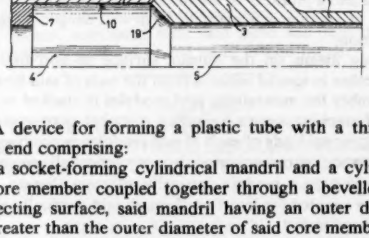
said platform attachment portion having substantially greater width than said penetrating tip producing a tapering platform-to-tip transverse profile,
at least a portion of one of said blades lying adjacent an edge of said platform and forming a closed end of said tool,
at least one of said blades terminating in a mating blade face adjacent an edge opposite said closed end of said tool,
said mating blade face having a longitudinal profile complimentary to said transverse profile.

4,131,407

DEVICE FOR FORMING TUBE WITH THICKENED SOCKET END

Warner J. de Putter, Hardenberg, and Willem C. den Hertog, Zwolle, both of Netherlands, assignors to Wavin B.V., Netherlands

Continuation of Ser. No. 578,662, May 19, 1975, abandoned, which is a division of Ser. No. 352,329, Apr. 18, 1973, Pat. No. 3,899,565. This application Aug. 9, 1976, Ser. No. 712,769
Claims priority, application Netherlands, Apr. 19, 1972, 7205280
Int. Cl.² B29C *17/00*
U.S. Cl. 425—393 **4 Claims**



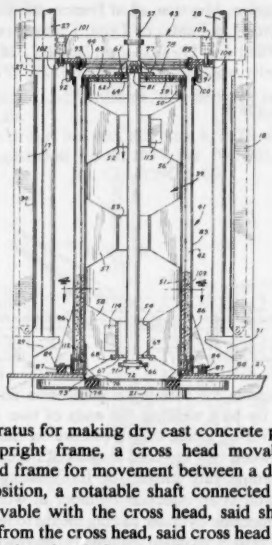
1. A device for forming a plastic tube with a thickened socket end comprising:
(a) a socket-forming cylindrical mandril and a cylindrical core member coupled together through a bevelled connecting surface, said mandril having an outer diameter greater than the outer diameter of said core member, said core member serving to receive over its outer surface a tube to be deformed;
(b) a hollow cylindrical mould having a first cylindrical mould portion fittingly and slidably engaging the outerside of said socket-forming mandril such that said first mould portion is at least partially positioned over said socket-forming mandril;
(c) a second cylindrical hollow mould portion connected to said first cylindrical mould portion, said second cylindrical hollow mould portion being disposed over said core member and having an inner diameter greater than the outer diameter of said socket-forming cylindrical mandril, said second cylindrical mould portion covering a portion of a tube to be deformed when such a tube is positioned over said core member;
(d) one of said socket-forming cylindrical mandril and said hollow cylindrical mould including means for passing cooling medium therethrough for cooling at least one of the surfaces of the plastic tube, after deformation, in an area adjacent to either said hollow cylindrical mould or said cylindrical core member;
(e) means for coaxially moving said hollow mould and said socket-forming mandril in opposite directions such that when a tube is placed over said core member and between said core member and said hollow mould, the end of the tube therebetween then being heated to its deformation point, the end of the tube will first expand so as to contact the second cylindrical hollow mould portion and then be allowed to slide over onto the outer side of said socket-forming mandril to form said thickened socket end; and
(f) said cylindrical mandril including means for forming a groove within the side of said thickened socket end in contact with said outer side of said socket-forming mandril.

4,131,408

MACHINE FOR MAKING DRY CAST CONCRETE PIPE

Joseph P. Schulster, 14830 San Marcos Dr., Brookfield, Wis. 53005; Stephen N. Halbach, 48 Merrill St., Nashua, Iowa 50658; Darrell Haar, 444 Lee Ave., Woodstock, Ontario, Canada (N4S 643), and Theron L. Crawford, 20501 W. Downie Rd., New Berlin, Wis. 53151

Filed Aug. 3, 1977, Ser. No. 821,540
Int. Cl.² B28B *21/12*
U.S. Cl. 425—410 **47 Claims**

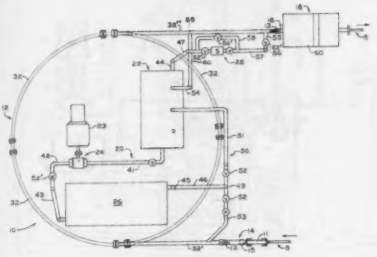


1. An apparatus for making dry cast concrete product comprising: an upright frame, a cross head movably mounted relative to said frame for movement between a down position and an up position, a rotatable shaft connected to the cross head and movable with the cross head, said shaft extended downwardly from the cross head, said cross head having drive means for rotating the shaft, an upright core supported on a support when the cross head is in the down position, said shaft extended downwardly into the core, said core and shaft having cooperating means for allowing the shaft to rotate independent of the core when the cross head is in the down position and for moving the core upwardly with the shaft whereby the core is lifted by the shaft in reponse to movement of the cross head from its down position to the up position, a jacket surrounding the core mounted on a support, said jacket being spaced from the core defining a chamber between the core and jacket, means closing the top of the core, means for moving concrete to the top of the core, at least one arm secured to the shaft, said arm located above the core and operable on rotation of the shaft to move concrete from the top of the core to the chamber, and means for moving the cross head from the down position to the up position whereby the core is withdrawn from the concrete product formed in the chamber between the core and jacket.

4,131,409
APPARATUS FOR VULCANIZING HOSE

William R. Babbin, Barberton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Aug. 25, 1977, Ser. No. 827,515
Int. Cl.[2] B29C *25/00;* B29H *7/14*
U.S. Cl. 425—445 7 Claims

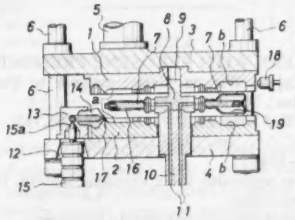


1. Apparatus for vulcanizing elastomeric hose comprising, an elongated chamber, said chamber having an entrance end and an exit end, means for circulating fluid at selected elevated temperature and pressure through said chamber from adjacent said entrance end to said exit end, fluid recovery means mounted adjacent to said exit end of the said chamber, means for recycling fluid from said recovery means to said fluid circulating means, said entrance end of said chamber having sealing means for receiving and moving unvulcanized hose into said chamber through said entrance end for transport through said chamber by said circulating fluid, and said fluid recovery means having a fluid level higher than in said chamber and said entrance end to provide a head of pressure to said fluid, and said fluid recovery means having an overflow conduit located therein to regulate said level in said fluid recovery means and provide an air chamber therein.

4,131,410
INJECTION BLOW-MOLDING MACHINE

Katashi Aoki, 6037, Oaza Minamijo, Sakaki-machi, Hanishina-gun, Nagano-ken, Japan

Continuation of Ser. No. 253,818, May 15, 1972, abandoned.
This application Aug. 9, 1977, Ser. No. 823,053
Claims priority, application Japan, May 21, 1971, 46-34628
Int. Cl.[2] B29D *23/03*
U.S. Cl. 425—533 3 Claims

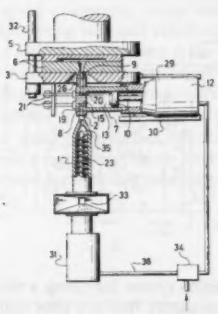


1. In an injection blow-molding machine of the type comprising a pair of female mold-halves attached to a movable plate and a fixed plate, respectively, with a parison cavity and a blow-molding cavity being formed symmetrically about a plane between the female mold-halves, and corresponding to each cavity a male mold having a blow hole therethrough and supported around a male mold supporting member fixed to a rotating shaft extended freely rotatable through the one of the female mold-halves which is attached to the fixed plate, wherein the improvement comprises a fixed hot-runner block, operable to receive an injection nozzle and receive molten material therefrom, is provided adjacent to the fixed mold half defining said parison cavity, wherein further a fixed hot-runner nozzle is disposed between the parison cavity and the hot-runner block, said fixed hot-runner nozzle having an inlet operable to receive and communicate molten material from said hot-runner block to a hot-runner nozzle outlet orifice, which is disposed perpendicular to said plane of symmetry and is operable to inject said molten material into said parison cavity, wherein further a gate in the form of a channel is provided within said fixed mold half, and between the outlet of said fixed hot-runner nozzle and said parison cavity, to cause a projecting portion to be formed on the bottom of each parison produced in the parison cavity, whereby molten material from said injection nozzle is communicated from said injection nozzle, through said hot-runner block and out of said fixed hot-runner nozzle outlet into said gate to there define a projecting portion of said parison immediately adjacent said hot-runner nozzle outlet, whereby said projecting portion remains attached to the bottom of the parison after the mold halves have been opened and said male mold supporting member is raised out of said fixed mold half, in a direction perpendicular to said plane of symmetry.

4,131,411
ARRANGEMENT FOR MANUFACTURE OF VOLUMINOUS PRODUCTS MADE OF PLASTICS

Lubomir Kupf, Praha, and Vladimir Kos, Luzna, both of Czechoslovakia, assignors to Statni vyzkumny ustav materialu, Prague, Czechoslovakia

Filed Mar. 21, 1977, Ser. No. 779,499
Int. Cl.[2] B29F *1/04*
U.S. Cl. 425—559 3 Claims



1. In an apparatus for injecting a volume of plastic melt into a mold through an inlet nozzle thereof, the improvement comprising:

a transfer unit comprising a cylindrical body having an end plate and a transfer chamber in said unit adjacent said end plate, a piston disposed in said chamber and mounted for sliding movement toward and away from said end plate, and a first hydraulic power cylinder coupled to said piston for urging said piston toward said end plate,

the portion of said piston adjacent said end plate having a generally frustoconical shape with a space between the periphery of the piston end face and the adjacent chamber wall,

said end plate having an inlet port, an inlet duct extending between said inlet port and said chamber, an inlet control valve in said inlet duct, an outlet port, means operatively associated with said end plate for coupling said outlet port to said inlet nozzle of said mold, an outlet duct extending between said outlet port and said chamber, and an outlet control valve in said outlet duct, said inlet and outlet

control valves having actuating means operable independently of each other;

an injection unit having a hollow filling cylinder with an outlet aperture communicating with said inlet port, the longitudinal axis of said cylinder being generally aligned with said inlet nozzle of said mold, an injection worm in said cylinder for feeding fluid material to said outlet aperture,

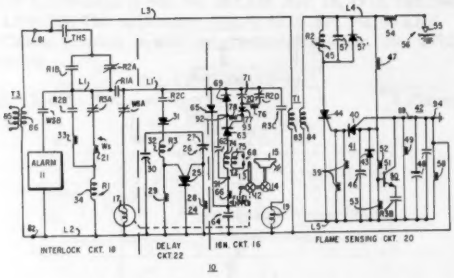
a second hydraulic power cylinder coupled to said worm; and

common hydraulic means connected to said power cylinders for operating said power cylinders.

4,131,412
FUEL IGNITION SYSTEM HAVING INTERLOCK PROTECTION AND ELECTRONIC VALVE LEAK DETECTION

Russell B. Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 621,670, Oct. 14, 1975, Pat. No. 4,035,134. This application Mar. 7, 1977, Ser. No. 774,959
The portion of the term of this patent subsequent to Jul. 12, 1994, has been disclaimed.
Int. Cl.² F23Q *9/12*
U.S. Cl. 431—16 **15 Claims**

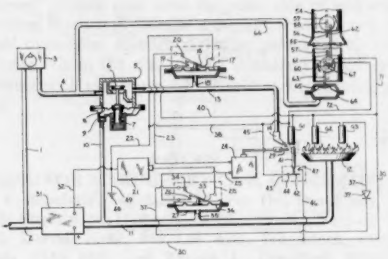


1. In a fuel ignition system including a pilot valve operable when energized to supply fuel to a pilot outlet for ignition to establish a pilot flame, and a main valve operable when energized to supply fuel to a burner apparatus for ignition by the pilot flame to provide a flame at said burner apparatus, a control circuit comprising interlock means including first switching means operable when enabled to energize said pilot valve, and to prepare an energizing path for said main valve, activate means operable in response to a request for heat to enable said first switching means, second switching means, flame sensing means for maintaining said second switching means disabled in the absence of a flame at said pilot outlet to permit said first switching means to be enabled by said activate means and for enabling said second switching means to operate when a pilot flame is established at said pilot outlet to prevent said first switching means from being enabled by said activate means, and delay means enabled by said second switching means when a pilot flame is sensed to effect the energization of said main valve at the end of a time interval initiated by the operation of said second switching means, said flame sensing means preventing the energization of said main valve in the event that a flame is provided at said burner apparatus during said time interval.

4,131,413
SELF-CONTAINED ELECTRIC IGNITER WITH RECHARGEABLE BATTERY

Robert W. Ryno, Mequon, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.

Filed Sep. 9, 1977, Ser. No. 831,751
Int. Cl.² F23Q *9/08*
U.S. Cl. 431—44 **10 Claims**



1. A self-contained ignition system for a gas burning heating unit having a pilot burner and a main gas burner, which comprises conduit means to conduct incoming gas to the pilot burner and the main gas burner, a rechargeable battery of a predetermined capacity located in the system, an igniter electrically connected to the battery, a pilot pressure switch activated by the pressure of the gas flowing to the pilot burner to initiate current flow from the battery to the igniter and thereby provide a spark from the igniter to ignite the gas flowing from the pilot burner, a main gas valve controlling the flow of gas through the main gas burner conduit means to the main gas burner, a voltage generating means located adjacent the pilot burner and actuated by the flame of the burner to produce a voltage providing a current to electrically open the main gas valve, additional voltage generating means in series with the first generating means and located adjacent the first named generating means and heated by the main gas burner to generate a predetermined voltage, a burner pressure switch connected to the main gas burner conduit means and actuated by the pressure of the gas in the main gas burner conduit means to establish an electrical circuit between the voltage generating means and the battery to recharge the battery and means in the circuit between the battery and the voltage generating means to prevent reverse flow of current from the battery to the generating means and a safety valve disposed in the pilot burner conduit means and constructed to close within a predetermined length of time in the event the pilot burner fails to ignite the incoming gas.

4,131,414
LANTERN WITH KEROSENE PREHEATER

Richard D. Curtis, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed May 11, 1977, Ser. No. 795,710
Int. Cl.² F21H *7/00*
U.S. Cl. 431—104 **3 Claims**

1. A preheat apparatus for a kerosene lantern, the preheat apparatus comprising:

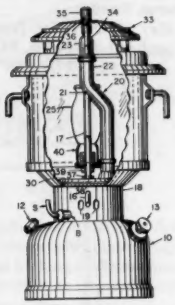
(a) a generator tube for vaporizing kerosene,

(b) a generally annular cup surrounding said generator tube and having a bottom wall and inner and outer walls defining a reservoir,

(c) a wick supported by the bottom wall of the cup for vaporizing kerosene, the wick having an outer surface which is spaced inwardly from the outer wall of the cup and extends above the outer wall of the cup to provide a vaporization space between the wick and the outer wall, and

(d) a foraminous element surrounding the wick and extending above the wick for entraining air in the kerosene vapor

which is vaporized by the wick, the foraminous element including a generally cylindrical portion which surrounds the wick and is spaced outwardly from the outer surface of the wick and an upper portion which extends above the



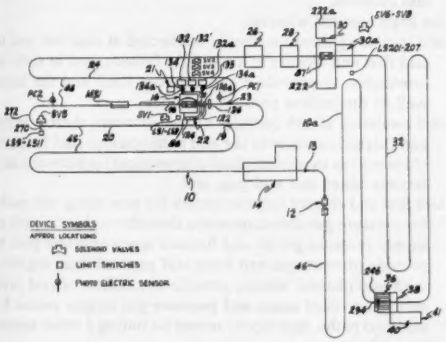
wick and which is constricted inwardly for providing a flame opening, the size of the flame opening and the vaporizing area of the wick being such that the vaporized kerosene, when ignited, produces a tall, narrow flame which encompasses a major portion of the generator tube.

4,131,415

CANDLE MANUFACTURING SYSTEM AND METHOD

Robert W. Flinn, Lakewood, Ohio, and Roy D. Robinson, Osceola, Ark., assignors to American Greetings Corporation, Cleveland, Ohio

Filed Mar. 14, 1977, Ser. No. 777,429
Int. Cl.[2] B29C *25/00, 13/00*
U.S. Cl. 264—138 **9 Claims**



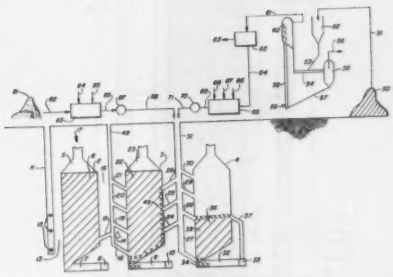
1. In a method of producing dipped taper candles including an overhead conveyor system with a mobile rack suspended therefrom, comprising providing rows of candle wicks on the rack in generally weight tensioned suspended relation therefrom, reciprocating the rack with the suspended wicks and associated tensioning weights through a predetermined number of dipping cycles at a dipping station including a tank of melted wax, to build up candle formations about the wicks, moving the rack and suspended candle formations to a cutoff station, clamping the candle formations to hold the latter stationary, including clamping said weights and holding the latter stationary from opposite ends thereof, and during said clamping cutting off the bases of the candle formations including the wax coated weights, to free the candle formations from the tensioning weights.

4,131,416

SLURRY BACKFILLING OF IN SITU OIL SHALE RETORT

George H. Watson, Naperville, and Thomas L. Speer, Warrenville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Aug. 30, 1977, Ser. No. 829,144
Int. Cl.[2] E21C *41/10*
U.S. Cl. 299—2 **8 Claims**



1. A process for the subterranean in situ retorting of oil shale and disposal of spent shale from surface retorting comprising:
forming a subterranean in situ retort so that the subterranean retort contains a mass of rubblized oil shale;
passing a retorting fluid through said rubblized mass so as to substantially retort said mass and recover hydrocarbons;
cooling the subterranean retort;
introducing water into the subterranean retort to wet the retorted mass of rubblized oil shale, prior to the introduction of a slurry of water and spent shale from surface retorting;
introducing a slurry comprising water and spent oil shale from surface retorting into said subterranean retort;
and introducing a slurry comprising water and sand at one or more points in the subterranean retort so as to form one or more drainage paths for the removal of water from the slurry of water and spent shale from surface retorting; so that the spent shale from surface retorting is effectively disposed of and a mechanically and environmentally suitable underground formation is established.

4,131,417

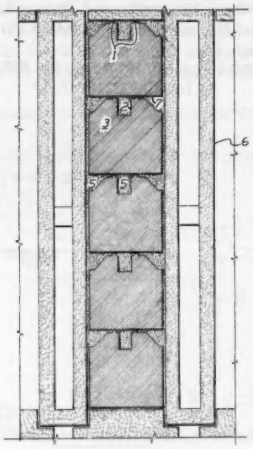
CARBON ELECTRODE PRODUCTION

Donald D. Dwight, Albemarle, N.C., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 15, 1977, Ser. No. 806,714
Int. Cl.[2] F27D *5/00*
U.S. Cl. 432—6 **2 Claims**

1. A method including baking two carbon articles in a chamber, wherein the improvement comprises the steps of: a) providing a protrusion and a stub hole on a face of one of the articles and arranging the articles side by side in the chamber with said protrusion and said stub hole located between the articles, whereby during baking any bonding between the articles is limited to the region of the protrusion so that the articles can later be separated with relative ease, and b) subsequently baking the carbon articles in the presence of a carbona-

ceous particulate support, with the carbonaceous particulate support being present in the stub holes, whereby the preven-



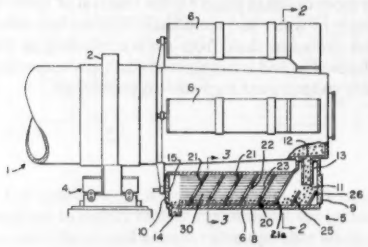
tion of stub hole distortion and adjoining carbon article blistering is improved.

4,131,418

TUBE COOLERS FOR ROTARY KILNS

Douglass J. Kramm, Allentown; Thomas R. Lawall, Emmaus, and Paul Talago, Center Valley, all of Pa., assignors to Fuller Company, Catasauqua, Pa.

Filed May 23, 1977, Ser. No. 799,885
Int. Cl.[2] F27D *15/00*
U.S. Cl. 432—80 **13 Claims**



10. Apparatus for cooling solid particulate material thermally treated in a rotary kiln including a plurality of elongated cylinders adapted to be mounted on a rotary kiln for rotation with said rotary kiln about the axis of the kiln, each of said cylinders having an inlet at one end for receiving hot solid particulate material discharged from said kiln; an outlet at the other end for discharging cooled solid particulate material from the cylinder; an inlet as said other end of the cylinder for supplying cooling air to the cylinder whereby the cooling air passes through the cylinder, the hot solid particulate material is cooled and the cooling air is supplied to the kiln as preheated combustion air; apparatus for improving the heat exchange within the cylinder comprising;

a helical conveyor mounted within each of said cylinders for advancing material from the inlet for solid particulate material to the outlet for solid particulate material; and

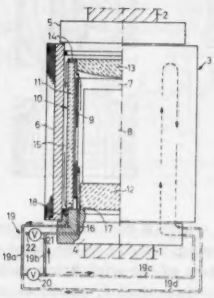
a plurality of circumferentially spaced apart fins mounted in each of said cylinders between at least some of the adjacent flights of said conveyor.

4,131,419

FURNACE FOR THE HIGH TEMPERATURE-HIGH PRESSURE TREATMENT OF MATERIALS WHICH INCLUDES PRESSURE MEDIUM CIRCULATION CHANNELS

Sven-Erik Isaksson, Robertsfors, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed May 20, 1977, Ser. No. 798,863
Claims priority, application Sweden, May 25, 1976, 7605887
Int. Cl.[2] F27B *5/04*
U.S. Cl. 432—205 **6 Claims**



1. In a furnace for the isostatic hot pressing of a workpiece which comprises:

a hollow cylinder;

separate end closures for sealing the open ends of the pressure cylinder, the end closures projecting into the cylinder;

heating members positioned within the pressure cylinder defining therewithin a furnace space; and

an insulated casing surrounding the furnace space and the heating members, the insulated casing including an insulating sheath supported at one end by a first of the separate end closures;

the improvement wherein;

said insulating sheath is fixedly connected at said one end to said first end closure in a gas-tight fashion, and in such an orientation to provide a gap between itself and the inner wall of the hollow pressure cylinder;

said insulating sheath includes a channel means therein at the end thereof opposite to the end connected to said first end closure so as to provide fluid communication between said furnace space and said gap; and

said first end closure includes means for providing two paths for pressure gas communication therethrough, one path to supply pressure gas to said furnace space and one path to provide pressure gas exit from said gap and thus, together with said channel means, provide circulation of said pressure gas to cool same, and pressure gas supply means for said two paths, said supply means including a valve means.

4,131,420

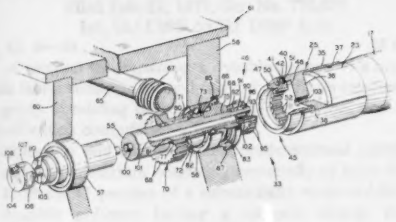
DRIVE CONNECTION FOR CONVEYOR ROLL

Alfred H. Miller, Toledo, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio

Filed May 2, 1977, Ser. No. 792,905
Int. Cl.[2] F27B *9/14;* **B65G** *13/06*
U.S. Cl. 432—246 **11 Claims**

1. In a conveyor roll for use in a sheet material supporting and conveying operation including a drive train and means connecting said drive train to said conveyor roll; the improvement wherein said connecting means comprises a coupling having a first section secured to one end of said conveyor roll, a second section having a portion telescopically received within said first section and provided with an axially projecting drive shaft operatively connected to said drive train, inter-

nal gear means formed on said first coupling section, external gear means mounted on said second section portion, said gear means engageable with each other for transmitting the torque



from said second coupling section to said first coupling section, and a retaining screw detachably connecting said drive shaft to said conveyor roll and locking said gear means of said first and second coupling sections in an engaged, intermeshing relation.

4,131,421

COKE OVEN CONSTRUCTION

Werner Abendroth, Haltern, Germany, assignor to Firma Carl Still Recklinghausen, Germany

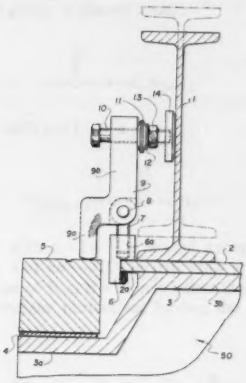
Filed Oct. 11, 1977, Ser. No. 840,960

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1976, 2646117

Int. Cl.[2] F27D *1/00, 1/18*

U.S. Cl. 432—247 **7 Claims**

1. A coke oven construction for the fastening of furnace door frames to the armor of horizontal, blockwise arranged coking furnaces, comprising a coke oven furnace having an armor plate, a furnace frame secured to said armor plate, a metal plate overlying said armor plate and having an edge extending outwardly from said armor plate, an anchor stand mounted on said metal plate adjacent said frame and extending outwardly therefrom, a hooked member engaged over the edge of said plate, a pivot member threadedly connected to said hooked member, a toggle member pivoted on said pivot member and having a first arm extending toward the furnace



and bearing against said furnace frame and a second arm extending outwardly from the furnace alongside said anchor stand, a pressure plate overlying said anchor stand and slidable therealong, a bolt threaded through said second arm and bearing against said pressure plate to press said second arm away from said pressure plate and to press said first arm against said frame.

4,131,422
POLYMER-PRINTED FABRIC AND METHOD FOR PRODUCING SAME

Manuel A. Thomas, and Jerry A. Cogan, Jr., both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Feb. 22, 1977, Ser. No. 770,877
Int. Cl.[2] C09B *65/00;* D06P *1/36*
U.S. Cl. 8—31 **18 Claims**

1. A method for imparting a dyeable pattern to a synthetic textile fabric substrate formed of synthetic fibers selected from the group consisting of polyester, acrylic, nylon, and blends thereof which comprises:

applying to said substrate, in a predetermined pattern, an aqueous admixture consisting essentially of from about 1 to about 45 percent of a substantially water-soluble acid dyeable polymer having a cationic charge in milliequivalents/gram of polymer of from about 0.01 to about 5, said aqueous admixture having a viscosity of from about 5 to about 50,000 centipoise; drying the resulting polymer printed substrate at a temperature effective to remove substantially all of the water therefrom; curing the substantially dried polymer printed substrate, and, dyeing the cured polymer printed substrate with a dye admixture containing an acid dyestuff preferential to the polymer coated portion of the substrate.

4,131,423
PROCESS FOR DYEING CELLULOSE FIBERS WITH VAT OR SULFUR DYES AND OXYHALOGEN ACID

Hiroshi Kato, Chibashi, Japan, assignor to Ise Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 29, 1977, Ser. No. 820,317
Claims priority, application Japan, Dec. 2, 1976, 51-144029
Int. Cl.[2] C09B *9/00, 49/00*
U.S. Cl. 8—34 **10 Claims**

1. In a process for dyeing cellulosic fibers, in which a water-soluble dye selected from the group consisting of sulfur dyes, vat dyes and sulfur vat dyes is reductively dissolved for adherence to the fibers and the dye is then fixed on said fibers by an oxidative treatment, the improvement which comprises using an oxyhalogen acid selected from the group consisting of $HClO_3$, $HBrO_3$ and HIO_3 as an oxidizing agent for said oxidative treatment.

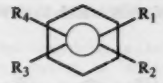
4,131,424
METHOD OF DYEING USING THE COMBINATION OF CERTAIN HALOGENATED HYDROCARBONS AND AROMATIC SOLVENTS IN AN AQUEOUS DYE ADMIXTURE

George Cocoros, Gaffney; Thomas V. Chambers, Inman, both of S.C., and Julian J. Hirshfeld, Gastonia, N.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

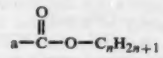
Filed Jul. 21, 1977, Ser. No. 817,585
Int. Cl.[2] D06P *5/06, 5/04, 1/44;* C09B *67/00*
U.S. Cl. 8—172 R **17 Claims**

1. A method of dyeing synthetic fibers, comprising the steps of:

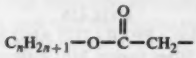
1. contacting the fibers with an aqueous dyeing admixture including from about 0.5% to 20% by weight based on the weight of said admixture of an organic dyeing formulation, said organic dyeing formulation including:
   a. from about 40% to 98% by weight based on the weight of said formulation of a halogenated hydrocarbon compound chosen from the group consisting of methylene chloride, chloroform, and 1,2 dichloroethane;
   b. from about 1% to 60% by weight based on the weight of said formulation of an aromatic carrier, said aromatic carrier being chosen from the group chosen from the group consisting of:
      i. Benzene derivatives having the structural formula



wherein each R_1, R_2, R_3 and R_4 individually is chosen from the group consisting of: a hydrogen, an alkyl group having 1–5 carbon atoms, a halogen, a hydroxyl group, a phenyl group,

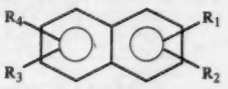


group with n=1−5, a

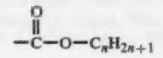


group with n=1−3, a benzyl group, a phenethyl group, and an $-NO_x$ group with x=1−3, and at least one of R_{1-4} is a moiety other than hydrogen;

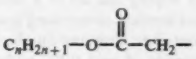
ii. Naphthalene derivatives having the structural formula



wherein R_1 - R_4 individually is chosen from the group consisting of: a hydrogen, an alkyl group having 1–5 carbon atoms, a halogen, a hydroxyl group, a phenyl group,



group with n=1−5, a



group with n=1−5, a benzyl group, a phenethyl group and an $-NO_x$ group with x=1−3, and at least one of R_{1-4} is a moiety other than hydrogen;

iii. mixtures of said aromatic compounds;

   c. an amount of dyestuff which is effective to dye said fibers to the desired depth of color;
   d. an effective amount of an emulsifier to disperse said halogenated hydrocarbon, said aromatic carrier and said dyestuff in said aqueous dyeing admixture;
2. heating the fabric to an effective temperature for an effective amount of time to fix the dyestuff; and
3. recovering the dyed fibers.

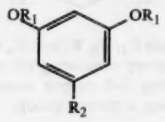
4,131,425
UREA ASSAY

Jerry W. Denney, Carmel, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.

Division of Ser. No. 740,612, Nov. 10, 1975, Pat. No. 4,074,972.
This application Mar. 13, 1978, Ser. No. 885,596
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230 B **4 Claims**

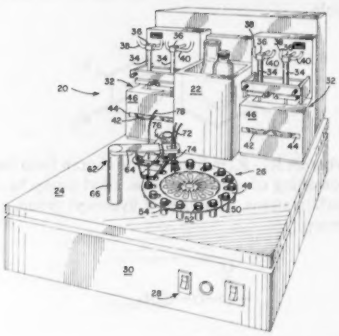
1. A process for the quantitation of urea in a fluid sample, comprising reacting the sample with a reagent containing an acidic solution of o-phthalaldehyde and an acidic solution of a chromogenic compound of the general class of compounds

consisting of 1,3 or 1,3,5 di- or tri-substituted hydroxy or methoxy benzene compounds, which have the following general structure:



where R_1 = —H, or —CH_3 and
where R_2 = —H, or —OH, or —OCH_3 and measuring the absorbance of the reacted sample mixture.

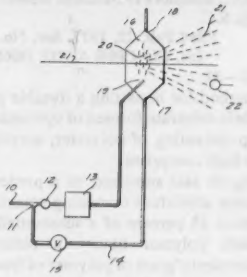
4,131,426
TIP WIPER APPARATUS AND METHOD
Richard J. Range, Silver Spring, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Aug. 24, 1977, Ser. No. 827,221
Int. Cl.² G01N *1/14*
U.S. Cl. 141—1 **15 Claims**



15. A method of wiping the tip of a sample aspirating and dispensing tube, said method comprising inserting said tube tip within a sample container, drawing an aliquot portion of said sample into the interior of said tube, withdrawing said tube from said container, supporting said tip portion against deflection and moving said tip portion of said tube toward a container into which said liquid is to be discharged, advancing two continuous ribbons of absorbent material from a supply station to a takeup station in response to movement of said tip support while guiding selected portions of said ribbons generally along the movement path of said tip and urging them into wiping contact with said tip during movement thereof toward said container into which said liquid is to be discharged.

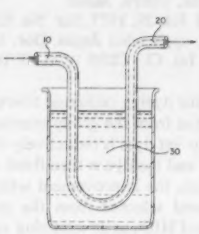
4,131,427
CHROMATOGRAPHY DETECTOR
Stewart Karp, 15 Field La., Roslyn Heights, N.Y. 11577
Continuation-in-part of Ser. No. 767,647, Feb. 10, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 877,489
Int. Cl.² G01N *31/08, 21/46, 21/26*
U.S. Cl. 23—230 R **2 Claims**

2. An apparatus for detecting and determining the quantity of a solute present in the carrier stream which emerges from a chromatographic column which comprises; a means for directing said carrier stream into a mixing cell in which said carrier stream mixes with a reference stream thereby causing the appearance of schlieren when said solute is present in said carrier stream; a means for directing a light beam through said cell to detect said schlieren, thereby causing the change of direction of some position of said light beam when said solute



is present in said carrier stream; and a means for detecting some or all of said light which had changed direction.

4,131,428
METHOD OF ADJUSTING PH
Albert A. Diggens, Newton, Mass., assignor to Orion Research Incorporated, Cambridge, Mass.
Continuation-in-part of Ser. No. 775,210, Mar. 7, 1977, abandoned. This application Jan. 13, 1978, Ser. No. 869,316
Int. Cl.² G01N *27/10, 27/40, 27/46*
U.S. Cl. 23—230 R **26 Claims**

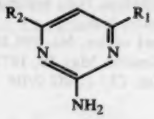


1. In a method for potentiometrically determining low levels of ion activity in sample streams without interference of hydrogen ion, the improvement comprising:
continuously passing the sample stream over one side of an inert non-impermeable non-wetting membrane that is permeable to a low molecular weight base reagent; and
diffusing a low molecular weight base reagent through the membrane and into the stream by contacting the other side of said membrane with the base reagent to thereby raise the pH of the stream to a value which eliminates interference of hydrogen ions without dilution of the sample stream and without introducing any interfering, reactive, or test ions into the sample stream.

4,131,429
UREA ASSAY
Jerry W. Denney, Carmel, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.
Division of Ser. No. 740,612, Nov. 10, 1976, Pat. No. 4,074,972. This application Mar. 13, 1978, Ser. No. 885,600
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **3 Claims**

1. A process for the quantitation of urea in a fluid sample, comprising reacting the sample with an acidic solution of o-phthalaldehyde and an acidic solution of a compound consisting of 4 or 4,6 substituted 2-aminopyrimidines where the

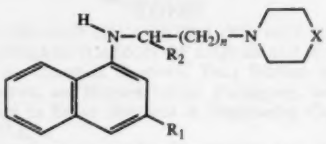
substituting group is an electron withdrawing group which have the following general structure:



where R_1 is —H or —OH or —OCH_3
where R_2 is —OH or —OCH_3 and measuring the absorbance of the reacted sample mixture.

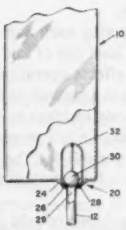
4,131,430
UREA ASSAY
Jerry W. Denney, Carmel, Ind., assignor to American Monitor Corporation, Indianapolis, Ind.
Division of Ser. No. 740,612, Nov. 10, 1976, Pat. No. 4,074,972. This application Mar. 13, 1978, Ser. No. 885,597
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **2 Claims**

1. A process for the quantitation of urea in a fluid sample, comprising reacting the sample with a reagent containing an acidic solution of o-phthaladehyde and an acidic solution of a chromogenic compound of the general class of compounds which have the following general structure:



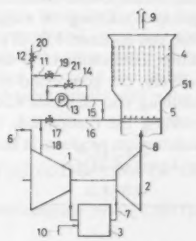
where R_1 = -H, —OCH, or —OH and
where R_2 = -H, —CH_3 or —C_2H_5 and
where X = O or C and
where n = 1, 2 or 3 and measuring the absorbance of the reacted sample mixture.

4,131,431
BLOOD SHUT-OFF VALVE
George G. Siposs, 2855 Velasco La., Costa Mesa, Calif. 92626
Filed Dec. 27, 1976, Ser. No. 754,345
Int. Cl.² A61M *1/03*
U.S. Cl. 422—45 **10 Claims**



1. A heart-lung oxygenator, said oxygenator having a reservoir and said reservoir having a blood outlet at the bottom of said reservoir;
a blood shutoff valve positioned at the outlet of said reservoir so that said blood shutoff valve can close when blood level falls in said reservoir, said valve comprising:
a valve body for connection into an extra-corporeal blood circuit, said valve body including an inlet, an outlet tube and an outlet member, said outlet member having a step therein;
a valve seat, said seat comprising an O-ring positioned in said step, said O-ring having an interior opening through which blood can flow to said outlet tube;
a valve member adapted to move from a position on said valve seat where it closes said valve to a position above said valve seat where it leaves said valve seat open for blood flow therethrough, said valve member being buoyant in blood so that in a fully charged system in the presence of blood, hemostatic force urges said valve member away from said valve seat to permit passage of blood downward through said outlet; and
restraining means secured to said outlet means and positioned near said valve seat, said restraining means comprising a cage which has legs secured to said outlet member with said legs extending upwardly away from said outlet member, said cage comprising an umbrella secured to said upright legs adjacent to the top thereof to restrain said ball in the vicinity of said outlet member, said umbrella being shaped to protect said ball against hemodynamic force which may cause closing, said umbrella engaging said valve member to retain said valve member in a position adjacent to said valve seat so that a lowering of blood level causes said valve member to move towards said valve seat and close said valve seat as blood level descends to said valve seat, said O-ring being in its recess so that said valve member can move onto said O-ring seat without delay or obstruction.

4,131,432
APPARATUS FOR THE TREATMENT OF GAS TURBINE EXHAUST GAS
Isao Sato; Yoshihiro Uchiyama; Youji Ishibashi; Satoshi Tsukahara; Ryoichiro Oshima, and Yukio Hishinuma, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Japan
Filed Feb. 10, 1977, Ser. No. 767,612
Claims priority, application Japan, Feb. 10, 1976, 51-12833
Int. Cl.² B01J *8/04;* C10B *21/20;* F01N *3/15, 3/16*
U.S. Cl. 422—177 **7 Claims**



1. Apparatus for treatment of combustion gas containing nitrogen oxides exhausted from a gas turbine that extracts work from high pressure combustion gases obtained from a combustion chamber burning fuel and compressed air, the apparatus for treatment being mounted within an exhaust duct leading from the turbine to the environment and including means arranged in the exhaust duct for silencing sound, wherein the improvement comprises:
means for containing reagent liquid including a reagent that will reduce the nitrogen oxides;
means arranged in the exhaust duct for holding catalyst including a plurality of gas permeable containers extending across the exhaust duct transversely with respect to the flow of the combustion gases through the exhaust duct; said plurality of gas permeable containers having intervals, therebetween in a direction transverse to the flow of the combustions gas;
catalyst, within each of said containers, that increases the

reduction reaction between the reagent and the nitrogen oxides contained within the combustion gas;

a plurality of atomizer means for atomizing the reagent liquid with air while injecting the reagent liquid upstream of said containers, so that the water of the reagent liquid cools the combustion gases to a temperature suitable for reaction with the reagent; said atomizer means including a plurality of liquid nozzles and an immediately adjacent plurality of air nozzles; said atomizer means further including a compressor for the gas turbine, air conduit means conducting pressurized air from said compressor commonly to all of said air nozzles, liquid conduit means conducting the reagent liquid from said means for containing reagent liquid commonly to all of said liquid nozzles, a liquid pump within said liquid conduit means for pressurizing the reagent liquid, valve means within said air conduit means for controlling the flow of pressurized air to said air nozzles, and valve means within said liquid conduit means for controlling the flow of pressurized reagent liquid to said liquid nozzles.

4,131,433

FUEL ADDITIVES, ADDITIVE COMPOSITIONS AND METHODS OF EMPLOYING SAME TO PREVENT CORROSION OF METAL SURFACES IN CONTACT WITH HOT GASEOUS COMBUSTION PRODUCTS

James F. Scott, Mt. Kisco, N.Y., assignor to The Perolin Company, Inc., Wilton, Conn.

Filed Jul. 27, 1977, Ser. No. 819,339
Int. Cl.[2] C01L *1/28*
U.S. Cl. 44—51 **46 Claims**

1. A fuel additive composition useful for incorporation in or admixture with fuels such that upon combustion of the fuels or in the presence of said additive composition when introduced into the fuel combustion products, metal surfaces in contact with said combustion products are subject to reduced corrosion and ash deposition, said additive composition consisting essentially of one or more compounds containing the elements selected from the group consisting of magnesium, silicon, chromium and chlorine, said elements Mg, Si plus Cr, Cl being present in said additive composition in the weight ratio $1/>0.5/>1.0$, respectively, the compound or compounds in said composition containing said elements silicon and magnesium forming or providing the compounds SiO_2 and MgO, respectively, in said combustion products in the weight ratio of at least 1 part SiO_2 to 1 part of MgO.

4,131,434

CATALYTIC COMPOSITION FOR INTERNAL COMBUSTION ENGINES, FURNACES AND BOILERS

Francisco Gonzalez, Juan Cordero 27, Circuito Pintores, Ciudad Satelite, Mexico

Continuation-in-part of Ser. No. 560,893, Mar. 21, 1975, abandoned. This application Sep. 24, 1976, Ser. No. 726,317
Claims priority, application Mexico, Jun. 3, 1974, 151431
Int. Cl.[2] C10L *1/22*
U.S. Cl. 44—62 **8 Claims**

1. A petroleum derived fuel composition of improved efficiency comprising:

a) a basic fuel selected from the group comprising fuel oil, diesel oil and gasoline, and

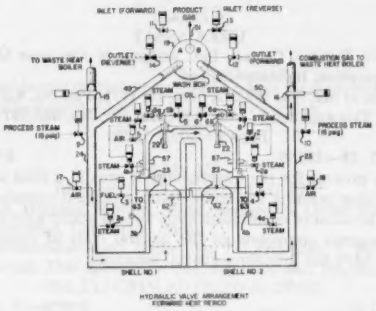
b) an additive composition comprising a mixture of aromatic hydrocarbons with up to two methyl groups, lower alkyl aliphatic ketones, and bicyclic terpene compounds of the formula $C_{10}H_{16}$, said additive composition being present in a microvolumetric concentration between 1/500 and 1/5000 by volume of the basic fuel.

4,131,435

AUTOMATIC CONTROL APPARATUS FOR OIL GAS MACHINE OPERATION

John C. Eck, Convent Station, N.J., assignor to Wilputte Corporation, New Providence, N.J.

Continuation-in-part of Ser. No. 594,217, Jul. 9, 1975, abandoned. This application May 19, 1977, Ser. No. 798,386
Int. Cl.[2] C10G *9/04*
U.S. Cl. 48—61 **2 Claims**



1. In automatic control apparatus for a unit comprising a pair of oil gas generators each of the type comprising two reactor shells operative alternately in a reverse directional flow system for the production of product gas, and wherein each of said gas generators comprises:

(a) inlet and outlet conduits for fuel, air, process oil, process steam, purge steam and product gas;

(b) solenoid controlled valves in said conduits for said two reactor shells of each of said gas generators for controlling burner fuel supply, burner air supply, process oil supply, process steam and burner purging steam therefor;

(c) rotary sequence switch means comprising a plurality of individual switches;

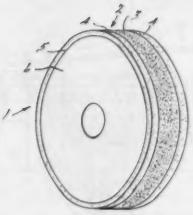
(d) circuitry so connecting each one of the switches of said switch means to at least one of said valves that rotation of said switch means effects operation of the valves of each one said generators in a manner to cause forward heat and forward make periods incident to rotation of said switch means through 50% of a full revolution, and reverse heat and reverse make periods for the same generator in the succeeding 50% of a full revolution of said switch means; and

(e) a wash box for each one of said pair of generators each wash box having two compartments via which product gas from the corresponding generators alternately passes to a receiver, the improvement wherein valve means is provided for reversing flow of liquid through the compartments of each of the said wash boxes, and wherein circuitry is provided between said sequence switch means and said valve means to cause flow of liquid through the wash boxes in one direction for forward phases of operation and in a reverse direction for reverse phases of operation of the corresponding generators.

4,131,436
OPHTHALMIC FLAT ROUGHING WHEEL

Ronald C. Wiand, 1790 Washington, Birmingham, Mich. 48009

Filed Sep. 12, 1977, Ser. No. 832,362
Int. Cl.[2] B24D 5/14, 7/14
U.S. Cl. 51—309 R 11 Claims

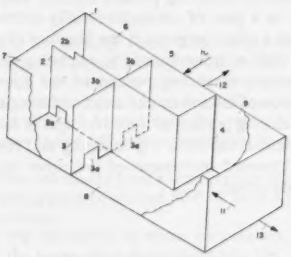


1. An ophthalmic flat roughing wheel having a circumferential layer made of a diamond-containing metallic matrix having a relatively greater concentration of diamond in the center than at the edges.

4,131,437
PROCESS FOR THE CONTINUOUS MULTISTAGE DEGASIFICATION OF LIQUID SULFUR

Thomas M. Campbell, Baytown, Tex.; William H. Ringler, Morristown, and Howard Lerner, Parsippany, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 642,346, Dec. 19, 1975, abandoned. This application Jun. 29, 1977, Ser. No. 810,916
Int. Cl.[2] B01D 19/00
U.S. Cl. 55—53 15 Claims

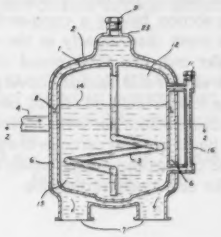


1. A process for the degasification of H_2S-rich liquid sulfur which comprises (1) continuously introducing said sulfur into the first stage of a contacting zone containing more than one discrete contacting stage such that the sulfur occupies the lower portion of said contacting zone; (2) continuously introducing an H_2S-lean carrier gas into the upper portion of the first stage of said contacting zone such that said carrier gas is separated from the liquid sulfur by an interface; (3) continuously withdrawing H_2S-lean liquid sulfur depleted in H_2S from the lower portion of a subsequent stage of said contacting zone; and (4) continuously withdrawing an H_2S-rich carrier gas from the upper portion of a subsequent stage of said contacting zone, the liquid sulfur within said contacting zone being maintained within a temperature range of from about 120° to about 160° C. as well as being recirculated within at least one discrete contacting stage at a rate of from about 1 to about 100 times the sulfur feed rate to said contacting stage.

4,131,438
DEGASSER AND LIQUID SEAL RESERVOIR

John S. Debrotnic, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 4, 1977, Ser. No. 848,622
Int. Cl.[2] B01D 19/00
U.S. Cl. 55—204 2 Claims



1. An apparatus for separating gas bubbles from a flowing liquid, comprising:

a. a vertically disposed inner cylinder,

b. a coaxially oriented outer cylinder of a diameter slightly larger than the inner cylinder,

c. a liquid inlet opening in the outer cylinder oriented to introduce the flowing liquid tangential to the outer cylinder in a substantially horizontal plane,

d. a liquid outlet opening in the lower region of the outer cylinder,

e. a baffle ring means, disposed horizontally between the two cylinders and above the liquid inlet opening, for limiting the flow rate of the liquid above said means to a rate incapable of drawing gas bubbles from above said means down into the liquid flowing below said means,

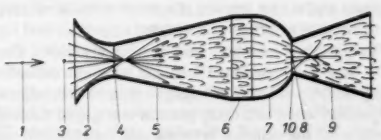
f. at least one gas trap means, in the shape of a vertically oriented trough along the outer surface of the inner cylinder extending from a location below the liquid inlet opening to a location above the baffle ring means, for separating gas bubbles from the flowing liquid by vortex action within the trough and entraining the gas bubbles within the trough until they rise above the baffle ring means, and

g. a gas venting means in the upper region of the outer cylinder and substantially above the baffle ring means.

4,131,439
DEVICE FOR THE DEDUSTING OF DUST-CONTAINING GASES

Heinz Hölter, Beisenstrasse 39-41, 4390 Gladbeck, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 735,946, Oct. 27, 1976, abandoned. This application May 18, 1977, Ser. No. 798,237
Int. Cl.[2] B01D 47/10
U.S. Cl. 55—220 1 Claim



1. A tubular device for dedusting dust-containing gases in which liquid in finely-distributed form has been incorporated, the device having a) an upstream inlet end, b) a downstream outlet end, c) at least one venturi-like constriction means therebetween for receiving dust-containing gaseous and liquid particles and for causing paths of the dust-containing gaseous and liquid particles to intersect one another when said dust-containing gaseous and liquid particles are concurrently passed

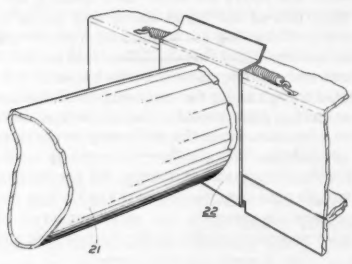
into said device through the upstream inlet end and past the constriction means from an upstream position; said constriction means comprising a first converging section having a decreasing cross-sectional dimension terminating at a position of narrowest cross-section, the paths of said particles intersecting downstream of the position of narrowest cross-section, and d) a first diverging section extending downstream of the position of narrowest cross-section; e) a second converging section positioned downstream of the first diverging section, the second converging section having a cross-sectional dimension which decreases more than linearly in the direction of the downstream outlet end; and f) a second diverging section adjoined downstream of said second converging section, the second diverging section and said second converging section joining at a junction which includes means for promoting contact between liquid and dust particles in a gas stream passed therethrough, the contact-promoting means comprising tear-off edge means for developing turbulence.

4,131,440

QUICK-CONNECT-AND-DISCONNECT ASSEMBLY

Eskill Aurell, Växjö, Sweden, assignor to Aktiebolaget Svenska Flaktrabriken, Nacka, Sweden

Filed Nov. 10, 1977, Ser. No. 850,098
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—302 **6 Claims**



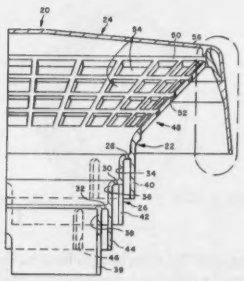
1. A quick-connect-and-disconnect assembly comprising a transverse element latched to a longitudinal element, said longitudinal element having a top wall and a front wall disposed substantially perpendicular to one another, said front wall having along the edge opposite said top wall a depending flange portion, said transverse element having an L-shaped clip, said L-shaped clip being inverted to have a body portion adapted to engage flush against the front wall of the longitudinal element and a foot portion disposed substantially at right angles to said body portion and adapted to overlie said top wall of the longitudinal member, said clip having along the edge opposite said foot portion a latching element comprising a reversely-bent lip adapted to engage behind a free edge of said flange portion when said body portion is engaged flush against said front wall, the distance between said foot portion and said latching element being greater than the height of said front wall to enable vertical displacement of said clip while engaged flush with said front wall whereby when said latching element is engaged behind said flange, portion clearance space is provided between said foot portion and said top wall, and on one of said longitudinal and transverse elements a resilient retainer operable to fill the space between said foot portion and said top wall and to thereby resiliently maintain said latching element in engagement with said flange portion.

4,131,441

MULTI-SIZE RAIN HOOD

Everett H. Randall, Warwick, R.I., assignor to Fram Corporation, East Providence, R.I.

Filed Nov. 17, 1976, Ser. No. 742,962
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—385 R **2 Claims**



1. A two-piece rain hood for the air intake system of an internal combustion engine comprising an annular body having an open end and a cover, said body having a tubular portion and a radially outwardly flared portion extending from the tubular portion, said cover joining with said body for closing said open end, said flared portion including a substantially conical wall having structure defining openings through which air communicates, said cover and said body including means locking said cover to said body, said locking means preventing separation of the cover from the body after the cover is mounted on the body, said cover including a closing portion closing said open end, and a circumferentially extending portion projecting from the closing portion and circumscribing the flared portion, said means for locking the cover on the body being positioned on the open end of the flared portion and on the cover at the juncture of the closing portion and the circumferentially extending portion thereof, said conical wall terminating in a pair of circumferentially extending legs diverging from a common point at the juncture of said legs with the conical wall, a circumferentially extending shoulder on the circumferentially extending portion of the cover facing the closing portion of the cover, and a circumferentially extending ring on the closing portion of the cover, one of said legs engaging said shoulder, the other leg engaging said ring which prevents radial inward movement of the other leg toward the center of said cover.

4,131,442

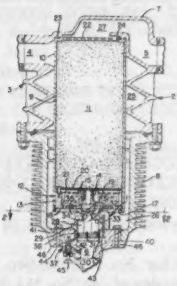
PNEUMATIC COMPACTOR FOR PARTICULATE DESICCANT

Lanier Frantz, Salem, Va., assignor to Graham-White Sales Corporation, Salem, Va.

Filed Apr. 29, 1977, Ser. No. 792,451
Int. Cl.[2] B01D *39/00*
U.S. Cl. 55—387 **6 Claims**

1. In a compressed gas filter assembly, the combination, with a filter unit having a housing removably seating between inlet and outlet ports thereof an open-ended canister containing a desiccant for selectively adsorbing a contaminant from gas passing therethrough between said ports, of sealing means between a downstream end of said canister and a seat therefor in said housing for sealing between said ports, and a pneumatic compactor comprising piston means actuated by compressed

gas for applying force to said desiccant and therethrough on said canister for respectively compacting said desiccant and



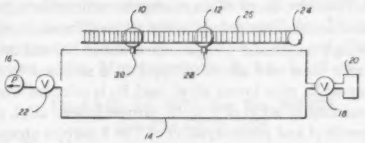
pressing said sealing means between said canister and housing for sealing between said ports.

4,131,443

FUSED SILICA NUCLEAR MAGNETIC RESONANCE AND FILTER CELLS WITH STABILIZED VAPOR DENSITIES

Donald S. Bayley, Bedford, N.Y., assignor to The Singer Company, Little Falls, N.J.

Filed Feb. 2, 1977, Ser. No. 765,136
Int. Cl.[2] C03B *5/16*; G01N *27/00*; G02B *5/24*
U.S. Cl. 65—17 **8 Claims**



1. A method for making fused silica cells containing an unsaturated vapor of atoms having an S_o ground state, such that the cells will have a stable vapor density, comprising:

(a) removing absorbed gases from fused silica cell blanks by baking out the cell blanks until the pressure of the absorbed gases in the cell blanks is reduced to around 10^{-7} torr;

(b) cooling the cell blanks from a temperature of around 900° C. to a temperature of around 800° C. over a period of at least two hours;

(c) cooling the cell blanks to room temperature;

(d) driving the vapor from a reservoir into the cell blanks;

(e) subjecting the cell blanks and the vapor contained therein to optical resonance radiation for around four hours at room temperature while the cell blanks are connected to the reservoir;

(f) establishing a prescribed vapor density within the cell blanks; and

(g) sealing off the cell blanks when the prescribed vapor density has been established.

4,131,444

METHOD FOR INCREASING THE STRENGTH AND DENSITY OF LEAD TITANATE CERAMIC BODIES

Basil E. Walker, Oxon Hill, Md.; Robert C. Pohanka, Springfield, Va.; Paul L. Smith, Westgate, Md., and Roy W. Rice, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1977, Ser. No. 818,710
Int. Cl.[2] C03B *11/00*; C04B *15/14, 35/00*
U.S. Cl. 65—32 **9 Claims**

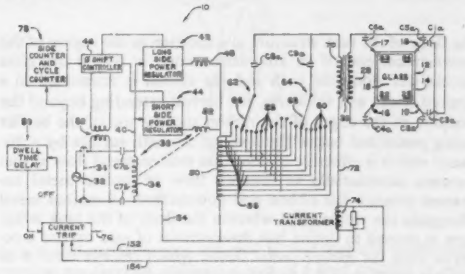
1. A method for producing a lead titanate ceramic from a lead titanate composition susceptible to Curie-point degradation which comprises hot-pressing a lead titanate composition comprising at least 98 weight percent of lead titanate with no other constituent in excess of one weight percent to form a lead titanate ceramic at a pressure from 1000 to 9000 psi and at a temperature from 700° C. to 1100° C. if said lead titanate is in a reducing atmosphere or at a temperature from 700° to 1200° C. if said lead titanate is in an oxidizing atmosphere; and cooling said lead titanate ceramic to room temperature.

4,131,445

METHOD OF SELECTIVELY HEATING AN EDGE OF A GLASS SHEET DURING A WELDING PROGRAM

Michael E. Klockenga, Peoria, Ill., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sep. 23, 1977, Ser. No. 836,258
Int. Cl.[2] C03C *27/00*
U.S. Cl. 65—40 **10 Claims**



1. In a method of heating marginal edge portions of a glass sheet having corners to a fusing temperature, wherein the method includes the step of applying a conductive stripe to marginal edge portions of the sheet; sequentially applying a voltage to adjacent pair of sheet corners to pass an electrical potential along the conductive stripe between the adjacent sheet corners; practicing the sequentially applying step for a predetermined number of heating cycles to heat the marginal edge portions to a temperature sufficient to pass current therethrough; and alternately applying an electrical potential to diagonally opposed corners of the sheet, wherein marginal edge portions on one side of diagonally opposed corners is a first current path and marginal edge portions on the other side of the diagonally opposed corners is a second current path, the improvement comprising:

adjusting the heat input into one or more of said marginal edge portions in one of said current paths during the last heating cycle until the difference in resistance between said first and second current paths is substantially reduced.

4,131,446

METHOD AND APPARATUS FOR MANUFACTURING FLAT GLASS ON MOLTEN METAL

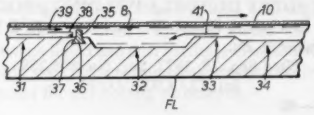
George A. Dickinson, St. Helens, England, assignor to Pilkington Brothers Limited, St. Helens, England

Continuation-in-part of Ser. No. 840,328, Oct. 7, 1977, abandoned, which is a continuation of Ser. No. 776,482, Mar. 10, 1977, abandoned. This application Nov. 21, 1977, Ser. No. 853,459
Claims priority, application United Kingdom, Nov. 30, 1976, 49918/76
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—99 A **38 Claims**

1. A method of manufacturing flat glass comprising advancing a ribbon of glass along a molten metal bath, constraining molten metal flow at a location of the bath substantially to forward flow entrained beneath the ribbon and counterflows alongside the ribbon from downstream of said location, receiv-

ing return flow of molten metal travelling in an upstream direction towards said location in a region of greater bath depth than the bath depth in an adjacent region, and establishing lateral access to the region of the bath supporting the ribbon upstream of said location for counterflows of molten metal coming from said region of greater bath depth.

19. Apparatus for manufacturing flat glass comprising an elongated tank structure having end walls, side walls and a floor for containing a bath of molten metal, means for delivering glass to the bath at a controlled rate and advancing the glass in ribbon form along the bath, means for applying traction to the ultimate ribbon of glass, and a transverse barrier on



the floor of the tank structure at a location in the region of the downstream end of an attenuation zone in which the glass accelerates along the bath and the ribbon is attenuated to a desired width and thickness, the barrier extending beyond the position of the edges of the ribbon and the top of the barrier being positioned below the level of the bath surface by a distance which is effective to constrain molten metal flow at that location substantially to forward flow of molten metal entrained beneath the ribbon and counterflow of molten metal alongside the ribbon, and wherein the floor of the tank structure is shaped to define just downstream of said barrier a reserve zone for molten metal flows, which reserve zone is of greater depth than the bath depth in an adjacent region.

4,131,447

CRUCIBLE FOR THE PRODUCTION OF SINGLE-MATERIAL LIGHT-GUIDING FIBERS

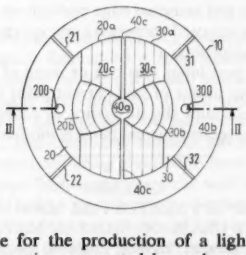
Hubert Aulich, Munich, and Josef Grabmaier, Kempfenhausen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 21, 1977, Ser. No. 761,267

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1976, 2603876

Int. Cl.[2] **C03B** *5/26, 37/00*

U.S. Cl. 65—325 **9 Claims**



1. A crucible for the production of a light-guiding fiber having a core portion connected by web portions to a surrounding annular member, comprising:

(a) an outer cylindrical member having an inner wall;

(b) a pair of separate hollow bodies not connecting to one another, each hollow body having an outer wall, an inner wall, and gas flow means for gas flow through an interior of the hollow body;

(c) support means between the inner wall of the outer cylindrical member and each hollow body for supporting the hollow bodies within the cylindrical member such that their inner walls face each other; and

(d) an exit nozzle formed at an exit end of the crucible, said exit nozzle including: (i) a core forming means formed at lower edge portions of the facing inner walls of the hollow bodies, (ii) web forming means connecting to the core forming means and formed at exit edge portions of the inner walls, and (iii) annular member forming means connected to the web forming means and formed at the outer cylindrical member and exit edge portions of the hollow body outer walls.

4,131,448

N-ORGANO-N-PHOSPHONOMETHYLGLYCINE-N-OXIDES AND PHYTOTOXICANT COMPOSITIONS CONTAINING SAME

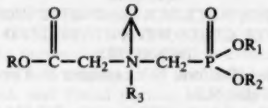
John E. Franz, Crestwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 613,708, Sep. 9, 1975, Pat. No. 4,062,669, which is a division of Ser. No. 313,706, Dec. 11, 1972, abandoned. This application Sep. 26, 1977, Ser. No. 836,338

Int. Cl.[2] **A01N** *9/36*

U.S. Cl. 71—86 **16 Claims**

1. A herbicidal composition comprising an inert adjuvant and an effective amount of a compound of the formula



wherein R_1 and R_2 are each independently selected from the group consisting of hydrogen, salt forming alkali or alkaline earth metal cations, ammonium or organic ammonium groups, said organic ammonium group being derived from an organic amine having a molecular weight below about 300 and containing not more than two amine groups, R is selected from the same group as R_1 plus lower alkyl, and R_3 is selected from the group consisting of alkyl of 1 to 12 carbon atoms, allyl, cyclohexyl, phenalkyl and phenoxyalkyl of 7 to 8 carbon atoms, and the mono and dichloro or bromo derivatives of such alkyl, allyl, cyclohexyl, phenalkyl and phenoxyalkyl.

4,131,449

PROPANIMIDOTHIOIC ACID DERIVATIVES

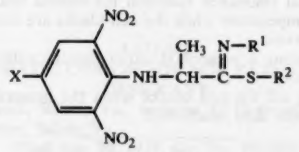
Ian D. Entwistle, Sittingbourne, England, assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 17, 1977, Ser. No. 842,772

Int. Cl.[2] **A01N** *9/36, 9/12, 9/14;* **C07C** *119/00*

U.S. Cl. 71—98 **9 Claims**

1. A compound of the formula



wherein X is a hydrogen atom, a halogen atom having an atomic number of from 9 to 35, inclusive, or an alkyl group containing from 1 to 6 carbon atoms optionally substituted by from 1 to 3 halogen atoms having an atomic number of from 9 to 35, inclusive, and R^1 and R^2 each independently is an alkyl group containing from 1 to 3 carbon atoms, or an acid addition salt thereof selected from hydrochloric, hydrobromic, sulfuric, fluorosulfonic, phosphoric, nitric, boric, borofluoric, maleic, fumaric, citric, tartaric, methanesulfonic, ethansulfonic, acetic or crotonic acid.

4,131,450
PROCESS FOR MANUFACTURING COBALT-BASE REDUCED POWDER

Yuichi Saito; Masayuki Iijima, and Osamu Mayama, all of Niigata, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 765,433, Feb. 4, 1977, abandoned. This application Feb. 9, 1978, Ser. No. 876,274
Int. Cl.[2] B22F 9/00; C22C 19/08
U.S. Cl. 75—0.5 BA **4 Claims**

1. A process for manufacturing a cobalt-base reduced powder which comprises:

adding, to a main raw material powder comprising cobalt oxide powder, chromium oxide powder and carbon powder, at least one metal oxide powder selected from the group consisting of manganese oxide powder, vanadium oxide powder, titanium oxide powder, tantalum oxide powder, niobium oxide powder, boron oxide powder, hafnium oxide powder, tungsten oxide powder, molybdenum oxide powder, iron oxide powder, nickel oxide powder and copper oxide powder;

mixing and pulverizing these powders to prepare a mixed powder;

reducing said mixed powder by heating to obtain a reduced sponge-like mass; and

finely pulverizing said reduced sponge-like mass.

4,131,451
METHOD FOR REMOVING ZINC FROM ZINC-CONTAINING SLAGS

Mark M. Lakernik, Strastnoi bulvar, 13a, kv. 32; Roza I. Shabalina, ulitsa Udaltsova, 4, kv. 26; Alexandr F. Gavrilenko, ulitsa Yaroslavskaya, 1/9, kv. 71; Anatoly A. Yakovenko, bulvar Yana Rainisa, 14, korpus 2, kv. 73; Anatoly I. Golovachev, Otkrytoe shosse, 6, kv. 48, and Tatyana S. Egorova, ulitsa Mescheryakova, 9, kv. 2, all of Moscow, U.S.S.R.

Filed May 10, 1977, Ser. No. 795,485
Int. Cl.[2] C22D 7/06
U.S. Cl. 75—14 **8 Claims**

1. A method for recovering zinc from a molten zinc-containing slag bath comprising the steps of:

reducing zinc containing compounds in said molten slag bath by superimposing said reducing agent onto said molten slag bath and flowing nitrogen into said molten slag bath in an amount of 0.5 to 3.5 $Nm^3/min.m^2$ of the molten bath surface to stir said molten slag bath and mix it with said reducing agent;

maintaining the temperature of said molten slag bath at a temperature ranging from 1220 to 1400° C.; and

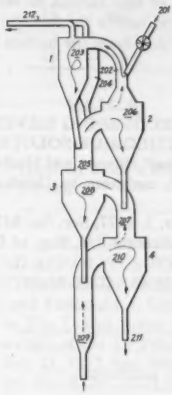
recovering zinc by condensation from the gases passing out of said molten slag bath.

4,131,452
METHOD FOR DIRECT MANUFACTURE OF CRUDE STEEL

Per H. Collin, Falun, Sweden, assignor to Stora Kopparbergs Bergslags AB, Falun, Sweden

Filed Mar. 14, 1977, Ser. No. 777,554
Claims priority, application Sweden, Mar. 17, 1976, 7603359
Int. Cl.[2] C21C 7/00
U.S. Cl. 75—60 **5 Claims**

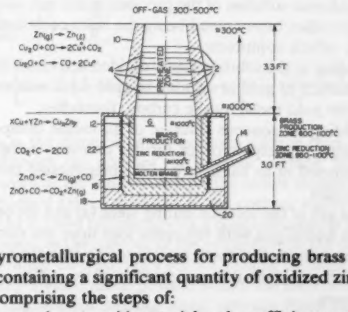
1. A method for making of crude steel by melt reduction, using as raw materials fine grained, iron oxide containing material, fine grained solid, liquid, and gaseous fuels and mixtures of said fuels and oxygen gas wherein fine grains are of a size less than 1 mm, comprising the steps of feeding the reaction, materials into a molten steel bath through at least one compound nozzle, each of which has a central opening and two concentrically surrounding annular slits, injecting said iron oxide containing material or iron oxide materials wherein the same are pre-reduced to FeO, by admixing said iron oxide materials with a fuel including fine grained slag formers, said injecting of the iron oxide, fuel and slag formers being into the steel bath through the inner annular slit at such a depth under the surface of the bath that said iron oxides become melt reduced before these reach the surface of the bath, injecting oxygen, at the same time as said iron oxide containing material, fuel and slag formers are being injected, through the central, circular opening and injecting hydrogen, through the outer annular slit at such a rate that the heat requirement for the melt reduction is satisfied by partial combustion in the bath of hydrogen and carbonaceous material in said fuel and producing reaction gas thereby, utilizing a part of a heat content of said reaction gas and utilizing said reaction gas for said pre-reduction of the iron oxide containing material, catalytically converting to H_2 the reaction gas leaving the steel bath, separating from said catalytically converted H_2 gas, CO_2 and H_2O, said residual gas thus being obtained consisting of hydrogen, which is injected through the outer annular slit of said compound nozzle.



4,131,453
PYROMETALLURGICAL BRASS PRODUCTION

Jonathan J. Kim, Chelmsford; Thomas A. Loose, Billerica, and Chih-Chung Wang, Lexington, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 18, 1977, Ser. No. 825,641
Int. Cl.[2] C21B 3/04
U.S. Cl. 75—72 **12 Claims**



1. A pyrometallurgical process for producing brass from a material containing a significant quantity of oxidized zinc, said process comprising the steps of:

1. adding carbon to said material and a sufficient amount of copper to provide a mixture having an overall Zn/Cu weight ratio of a selected value of 0.66 or less;
2. adding the mixture to the top of a shaft furnace;
3. preheating the mixture in the shaft of said furnace to a temperature of 300° C. or more;

4. allowing the mixture to descend in said furnace to a brass producing zone through which zinc vapor rises to cause the vapor to alloy with copper to form brass which settles and forms a molten brass reservoir;
5. allowing the mixture to descend in said furnace to a zinc reduction zone wherein the temperature is above 950° C. and where ZnO in the mixture is reduced to produce zinc vapor which rises to the brass zone;
6. condensing zinc vapor rising through the brass producing zone in the shaft of said furnace to reduce the need for treating zinc vapor outside the furnace; and,
7. removing liquid brass from the molten brass reservoir.

4,131,454
PROCESS FOR RECOVERING SILVER AND GOLD FROM CHLORIDE SOLUTIONS

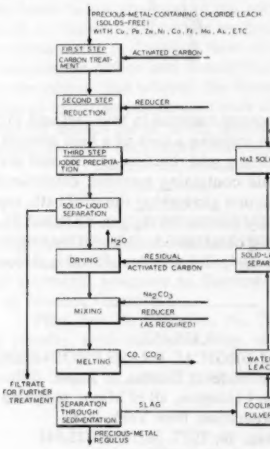
Norbert L. Piret; Meinolf Höpper, and Herbert Kudelka, all of Duisburg, Germany, assignors to Duisburger Kupferhütte, Duisburg, Germany

Filed Nov. 2, 1977, Ser. No. 847,888

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1976, 2656233

Int. Cl.² C22B *11/04*

U.S. Cl. 75—83 **23 Claims**



1. Process for selectively separating precious metal selected from the group consisting of gold, silver and mixtures thereof from a chloride solution of the precious metal and other heavy metal, the other heavy metal being the main constituent of the solution, which comprises:

(a) adding to the solution finely divided activated carbon for reduction of gold in solution to gold metal and absorption of the gold metal by the carbon, thereafter,

(b) adding an aqueous solution of an iodine compound for selective precipitation of further precious metal and the formation of an admixture of the precipitated metal in the solution,

(c) the pH of the solution during steps (a) and (b) being such that hydrolysis with the metal ions does not occur,

(d) the potential of the solution during step (b) being such that no substantial decomposition of the iodine compound occurs,

(e) separating the precipitated precious metal and active carbon from the admixture formed in step (b), drying the separated precious metal and active carbon and admixing the dry product with an iodine binder and subjecting the resulting admixture to reduction for formation of a regulus containing the precious metal.

4,131,455
SILVER RECOVERY

Lars T. Edwards, and Lyle N. Trowbridge, both of Queensbury, N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 9, 1977, Ser. No. 859,154

Int. Cl.² C22B *11/04*

U.S. Cl. 75—118 R **9 Claims**

1. Method for recovery of metallic silver of high purity from acid insoluble silver salt contaminated with more than about 2,000 ppm other metals, which method comprises:

a. first washing said silver salt with water at a pH less than 3;

b. then reacting thus washed silver salt with alkali metal borohydride at a pH greater than 12 to form metallic silver; and

c. recovering metallic silver contaminated with less than 1,000 ppm of such other metals.

4,131,456
CHILL-FREE FOUNDRY IRON

Lev V. Peregudov, ulitsa Puzakova 39, Kv. 231, and Mikhail M. Malashin, ulitsa Liteizina, 74, kv. 30, both of Tula, U.S.S.R.

Filed Dec. 12, 1977, Ser. No. 859,759

Int. Cl.² C22C *37/00*

U.S. Cl. 75—124 **3 Claims**

1. A chill-free foundry iron consisting essentially of, in per cent by weight:

carbon	from 2.8 to 4.0
silicon	from 1.5 to 2.6
manganese	from 0.2 to 1.2
cerium	from 0.01 to 0.05
aluminium	from 0.06 to 0.6
calcium	from 0.04 to 0.10
sulfur	up to 0.20
phosphorus	up to 0.30
and iron	the balance

4,131,457
HIGH-STRENGTH, HIGH-EXPANSION MANGANESE ALLOY

Earl L. Frantz, Reading, Pa., assignor to Carpenter Technology Corporation, Reading, Pa.

Filed Oct. 11, 1977, Ser. No. 840,799

Int. Cl.² C22C *22/00*

U.S. Cl. 75—134 M **23 Claims**

1. A high thermal expansion and/or high electrical resistivity manganese alloy having high mechanical strength, in weight percent, comprising about

	w/o
Copper	5–30
Nickel	5–30
Nitrogen	0.1–1.0

the balance being at least about 65% to less than 85% manganese, and in which the nitrogen present is substantially in solid solution and strengthens the alloy.

4,131,458
ELECTRICAL CONTACT MATERIAL OF SILVER BASE ALLOY

Mitsunori Satoh, Yokohama; Masayuki Hijikata, Tokyo; Hiroshi Maeda, Funabashi, and Ichiro Morimoto, Tokyo, all of Japan, assignors to National Research Institute for Metals, Tokyo, Japan

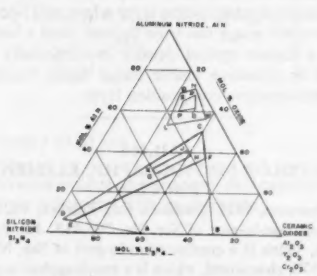
Filed Oct. 18, 1977, Ser. No. 843,281
Claims priority, application Japan, Oct. 21, 1976, 51/125451
Int. Cl.[2] C22C *5/06*
U.S. Cl. 75—173 R 2 Claims

1. An electrical contact material consisting essentially of silver and uniformly dispersed in the silver,
(a) 1 to 12 atomic % of zinc oxide and
(b) 0.1 to 1 atomic % of tellurium oxide, the total amount of (a) and (b) being 2 to 13 atomic %, and all amounts being calculated as metal.

4,131,459
HIGH TEMPERATURE RESISTANT CERMET AND CERAMIC COMPOSITIONS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of and Wayne M. Phillips, La Crescenta, Calif.

Division of Ser. No. 633,876, Nov. 20, 1975, Pat. No. 4,072,532.
This application Dec. 8, 1977, Ser. No. 858,766
Int. Cl.[2] C22C *29/00*
U.S. Cl. 75—203 15 Claims



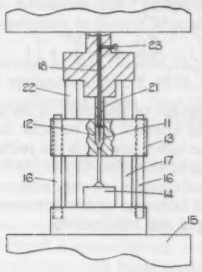
1. A process for producing a high temperature oxidation resistant cermet composition which comprises sintering a mixture of (a) metal or metal alloy particles and (b) a ceramic material comprising silicon nitride and an oxide selected from the group consisting of aluminum oxide, yttrium oxide and chromium oxide, to form a cermet composition of said metal or metal alloy particles coated with and dispersed in a solid solution of said ceramic material.

4,131,460
METHOD OF PRODUCING A SINTERED COMPOSITION

Raymond L. Orford, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Mar. 17, 1977, Ser. No. 778,605
Claims priority, application United Kingdom, Mar. 20, 1976, 11321/76
Int. Cl.[2] B22F *1/00*; H01R *39/20*
U.S. Cl. 75—204 10 Claims

1. A method of producing a brush for a dynamo electric machine, including the steps of compacting a powder from which the brush is to be made comprising a mixture of silicon carbide, copper and carbon around one end of an electrical lead with the remainder of the lead projecting from the compacted powder, and then heating in a non-reducing atmosphere the assembly of the lead and the compacted powder to sinter

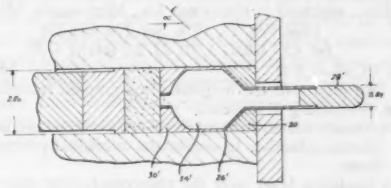


the powder into the required brush and physically electrically connect the lead to the brush.

4,131,461
METHOD AND APPARATUS FOR USE IN THE EXTRUSION OF BILLETS

Vincent De Pierre, and Ferdinand J. Gurney, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,490
Int. Cl.[2] B22F *3/02, 3/20*
U.S. Cl. 75—208 CS 3 Claims



1. An extrusion billet, for extrusion metal powder products, for passing through a die having a radius R_f and an entrance taper having a half angle α comprising: a metal container having a cylindrical element, a nose cap at one end of the cylindrical element and a tail cap at the other end of the cylindrical element; said nose cap having a projection extending into said container; said projection having a contour substantially conforming to the relationship

$$Z_o = \frac{R_o}{3\sin\alpha}\left[1 - \frac{R_f^3}{R_o^3}\right]\left[2 - 3\left(1 - \frac{R_1^2}{R_o^2}\sin^2\alpha\right)^{\frac{1}{2}} + \left(1 - \frac{R_1^2}{R_o^2}\sin^2\alpha\right)^{-\frac{1}{2}}\right]$$

where Z_o is the distance of the contour surface from a plane passing through the apex of the contour surface; Ro is the outside radius of the billet; and R_1 is the radius measured from the longitudinal axis of the billet to the contour surface corresponding to Z_o; said tail cap having a concave contour substantially the same as the contour of the projection on the nose cap; a powder filling tube, having a portion passing through said tail cap; a finely divided metal powder within the metal container.

3. The method for making metal powder filled billets for extrusion through a die having a radius R_f and an entrance taper with a half angle α, comprising: machining a nose cap, adapted to fit into one end of a cylindrical housing, with a convex projection approximately conforming to the relationship

$$Z_o = \frac{R_o}{3\sin\alpha}\left[1 - \frac{R\beta}{R_o^3}\right]\left[2 - 3\left(1 - \frac{R_1^2}{R_o^2}\sin^2\alpha\right)^{\frac{1}{2}} + \left(1 - \frac{R_1^2}{R_o^2}\sin^2\alpha\right)^{-\frac{1}{2}}\right]$$

where Z_o is the distance of the contour surface from a plane passing through the apex of the contour surface; Ro is the outside radius of the billet; and R_1 is the radius measured from the longitudinal axis of the billet to the contour surface corresponding to Z_o; machining a tail cap, adapted to fit the other end of a cylindrical housing, with a concave surface approximately conforming to the relationship

$$Z_o = \frac{R_o}{3\sin\alpha}\left[1 - \frac{R\beta}{R_o^3}\right]\left[2 - 3\left(1 - \frac{R_1^2}{R_o^2}\sin^2\alpha\right)^{\frac{1}{2}} + \left(1 - \frac{R_1^2}{R_o^2}\sin^2\alpha\right)^{-\frac{1}{2}}\right]$$

drilling a hole in the tail cap; securing a filler tube in said hole; securing the nose cap and the tail cap in opposite ends of a cylinder with the concave projection and the concave surface directed inwardly of the cylindrical housing; filling the cylindrical housing with a fine metal powder.

4,131,462

ELEMENT FOR THERMOPLASTIC RECORDING

Tzuo-Chang Lee, and Jacob W. Lin, both of Bloomington, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 17, 1976, Ser. No. 658,324
Int. Cl.[2] G03G *5/10, 13/22;* B41M *5/20*
U.S. Cl. 96—1.5 R **15 Claims**

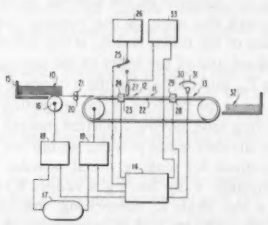
1. An improved thermoplastic holographic recording medium comprising in sequence:
   a substrate coated with an electrically conductive layer;
   a photoconductive layer on the electrically conductive layer;
   an insulating layer over the photoconductive layer which insulating layer is photosensitive at a wavelength other than the recording wavelength; and
   a thermoplastic layer over the insulating layer.

4,131,463

ELECTRIC RECORDING PROCESS OF IMAGES USING ELECTRON SENSITIVE LAYER CONTAINING TRIVALENT COBALT COMPLEX AND COMPOUND HAVING CONJUGATED π BOND SYSTEM

Masayoshi Tsuboi, Asaka; Yoshiaki Suzuki, Minami-ashigara, and Masatoshi Tabei, Asaka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 19, 1977, Ser. No. 834,736
Claims priority, application Japan, Sep. 17, 1976, 51-111515
Int. Cl.[2] G03G *17/02*
U.S. Cl. 96—1 E **8 Claims**



1. An image-recording process for recording images by using a recording material comprising a support, at least the surface of which is electrically conductive, with this electrically conductive surface having thereon an electron-sensitive composition layer substantially containing a trivalent cobalt complex compound, a compound having a conjugated π bond system capable of forming at least a bidentate ligand with a divalent or trivalent cobalt ion and a binder as an image-recording layer, which process comprises the steps of:
   (1) imagewise generating in said image-recording layer sufficient electric current to form a latent image; and
   (2) reducing said trivalent cobalt complex compound in the areas wherein the electric current has passed in step (1) by substantially uniformly heating at least said image-recording layer.

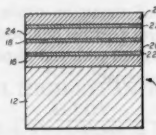
6. An image-recording process for forming visible images using an image-recording material comprising a support, at least the surface of which is electrically conductive, having on said electrically conductive surface a layer of an electron-sensitive composition substantially containing (a) a trivalent cobalt complex compound, (b) a compound having a conjugated π bond system capable of forming at least a bidenate ligand with a divalent or trivalent cobalt ion, (c) a binder and (d) a compound capable of absorbing electromagnetic waves of a wavelength not longer than about 350 nm as an ultraviolet light absorbing agent, which comprises:
   imagewise passing sufficient electric current in said electron-sensitive composition layer to form a latent image or a primitive visible image, and heating at least said electron-sensitive composition layer to thereby reduce said trivalent cobalt complex compound in the areas of said electron-sensitive composition layer where said latent or primitive visible image has been formed, thus a visible image with a higher optical density in conformity with said latent or primitive visible image being formed in said electron-sensitive composition layer.

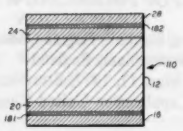
4,131,464

FALSE COLOR PHOTOGRAPHIC ELEMENT AND PROCESS

Avrum Silverman, 9512 Braddock Rd., Fairfax, Va. 22032

Continuation-in-part of Ser. No. 703,413, Jul. 8, 1976, abandoned, which is a continuation-in-part of Ser. No. 578,397, May 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 447,290, Mar. 1, 1974, abandoned. This application Jul. 29, 1977, Ser. No. 820,023
Int. Cl.[2] G03C *7/16, 1/76*
U.S. Cl. 96—22 **21 Claims**





1. A photosensitive element for producing a false color image from a monochromatic source image and the like; comprising four light sensitive silver halide emulsion layers having a composition to produce differing tonal gradations; two emulsion layers containing color couplers and the other two emulsion layers free of color couplers; said photosensitive element

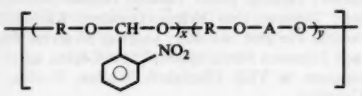
having a supoort for supporting the four emulsion layers; said photosensitive element also comprising integral means for the differential reexposure of two emulsion layers; one of said four emulsion layers producing a negative dye image in a first color, another of said four emulsion layers producing a positive dye image in a second color, the remaining two emulsion layers producing a positive dye image and a negative dye image both in the same third color; the four dye images forming three substantially opposite tonal gradations in cyan, magenta and yellow colors.

4,131,465
RADIATION SENSITIVE POLYMERIC O-NITROPHENYL ACETALS AND ELEMENT

Constantine C. Petropoulos, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 684,696, May 10, 1976, Pat. No. 4,086,210. This application Sep. 27, 1977, Ser. No. 836,987
Int. Cl.² G03C *1/94*
U.S. Cl. 96—35 **18 Claims**

1. A radiation-sensitive composition comprising a radiation-sensitive linear polymer comprising recurring units of the structure



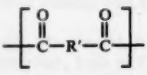
where

x ranges from 1 to 20 and

y is 0 or 1,

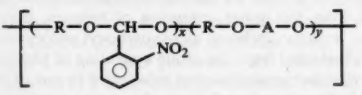
R is the divalent residue of an organic diol capable of forming a linear polyacetal with an aldehyde,

A is



where R′ is arylene, and a solvent for said polymer.

10. A radiation-sensitive element comprising a support bearing a layer of a radiation-sensitive linear polymer comprising recurring units of the structure



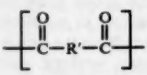
where

x ranges from 1 to 20 and

y is 0 or 1,

R is the divalent residue of an organic diol capable of forming a linear polyacetal with an aldehyde,

A is



where R′ is arylene.

4,131,466
PHOTOGRAPHIC METHOD OF MAKING RELIEF MEMBER WITH NEGATIVE DYE IMAGE

Masahiro Nomura, Kasukabe, and Yutaka Hirabayashi, Tokyo, both of Japan, assignors to Somar Manufacturing Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 336,322, Feb. 27, 1973, abandoned. This application Dec. 8, 1975, Ser. No. 638,362
Claims priority, application Japan, Mar. 5, 1972, 47/22564
Int. Cl.² G03C *5/34, 5/24;* G03F *1/00*
U.S. Cl. 96—49 **8 Claims**

1. A method of making a photorelief member comprising the steps of

exposing to an image of actinic radiation a member comprising a transparent synthetic resin film and a photoinsolubilizable layer formed thereon having a thickness from 0.5 micron to 12 microns, said layer comprising (a) type A gelatin having an isoelectric point of about 7 to 9 and a pH of from about 4 to about 9 and (b) a photosensitive, diazonium compound consisting of a condensation product of an unsubstituted p-aminodiphenylamine or a substituted p-aminophenylamine where the functional group is substituted directly to the phenyl nuclei, said functional group being selected from the group consisting of an alkyl group containing 1 to 4 carbon atoms, an alkoxy group containing 1 to 4 carbon atoms, a halogen and a combination thereof and an aldehyde where the ratio of said type A gelatin to said photosensitive, diazonium compound is 20:1 to 60:1, by weight, to thereby photoinsolubilize the exposed portions of the layer;

subsequent to said exposing step, dyeing said layer with an aqueous solution of a dye selected from the group consisting of an acid dye and a direct dye so that both the exposed and unexposed portions of said layer are dyed; and

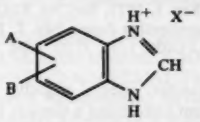
subsequent to said dyeing step, washing the dyed layer with water to dissolve the unexposed portions of said layer to thereby form said photorelief member comprising the dyed photoinsolubilized layer portions disposed on said transparent synthetic resin film.

4,131,467
4,7-DIHYDROXYBENZIMIDAZOLE HYDROBROMIDE AS ANTIFOGGER

John H. Bigelow, St. Petersburg, Fla., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

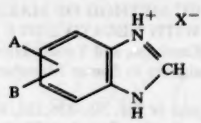
Filed Nov. 23, 1977, Ser. No. 854,262
Int. Cl.² G03C *5/30, 1/34*
U.S. Cl. 96—66.3 **15 Claims**

1. A photographic element comprising a support having thereon a light-sensitive silver halide emulsion layer, said layer containing a dihydroxybenzimidazole hydrohalide of the formula



wherein A and B are hydroxy radicals in the 4,7 or 5,6 positions, and X^- is Br^-, Cl^- or I^-, the concentration of said hydrohalide being 5×10^{-6} mole to 5×10^{-2} mole/mole of silver halide.

8. A photographic developer containing a silver halide developing agent and a dihydroxybenzimidazole hydrohalide of the formula



wherein A and B are hydroxy radicals in the 4,7 or 5,6 positions and X^- represents Br^-, Cl^- or I^-; said dihydroxybenzimidazole hydrohalide being present in an amount of 10^{-6} to 10^{-2} moles/liter of developing solution.

4,131,468

DIAZOTYPE MATERIALS

Stuart C. Rennison, Hadleigh; John A. Pope, Colchester, and Timothy D. Andrews, East Bergholt, near Colchester, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Jan. 17, 1975, Ser. No. 542,021

Claims priority, application United Kingdom, Jan. 25, 1974, 3591/74

Int. Cl.[2] G03C *1/52, 3/02*

U.S. Cl. 96—75 **7 Claims**

1. A light sensitive diazotype material suitable for use in high speed copying machines which comprises a plastic support film coated with a layer which includes a light sensitive diazonium compound and also

(a) a resinous binder applied directly to the surface of the support film or to an underlying subbing layer, or

(b) a receptive plastics material impregnated with said diazonium compound,

wherein an anti-slip material comprising a homopolymer or copolymer of acrylic acid or methacrylic acid or a lower alkyl ester of acrylic acid or methacrylic acid in which the alkyl group contains up to 8 carbon atoms as an anti-slip material is either incorporated in said layer which includes said diazonium compound or applied thereto to produce a surface roughness, said homopolymer or copolymer being present in an amount of 0.75 to 25 mg/dm^2 of the film surface.

4,131,469

PHOTOGRAPHIC ELEMENT WITH POLYMERIC AMMONIUM MORDANT

Takushi Miyazako; Shinji Sakaguchi; Sosuke Hanai, and Yukio Karino, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

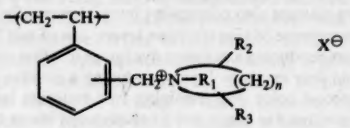
Filed Sep. 1, 1977, Ser. No. 829,858

Claims priority, application Japan, Sep. 1, 1976, 51-104525

Int. Cl.[2] G03C *1/40, 7/00, 1/84, 1/72*

U.S. Cl. 96—77 **12 Claims**

1. A diffusion-transfer, integral negative image-receiving, photographic element comprising a support having thereon at least one layer containing a silver halide photographic emulsion associated with a dye image-providing material which is capable of providing an acidic and diffusible dye or a precursor thereof and at least one hydrophilic colloid layer containing a polymer in an amount of at least 10% by weight based on the weight of the hydrophilic colloid used therein with repeating units in which at least 20 mol % of the repeating units are represented by the following general formula (I)



(I)

wherein R_1 represents an alkyl group containing 1 to 12 carbon atoms, an aralkyl group, an aryl group or an allyl group; R_2 and R_3, which can be the same or different, each represents a hydrogen atom, an alkyl group, an aralkyl group, an aryl group or an allyl group, where the total number of carbon atoms present in the main chain and/or ring of R_2 and R_3 is less than 16; n represents an integer from 2 to 20; and $X^\ominus$ represents an anion.

4,131,470

PROCESS FOR THE STABILIZATION AND ANTIFOGGING OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS

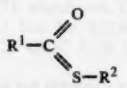
Günther Fischer, Leipzig; Beate Wenzel, Dessau-Süd; Steffen Scheithauer, Dessau; Udo Franz, Dresden; Karl-Wilhelm Jünge, Dessau; Christof Schröter, Leipzig; Siegfried Gahler, Wolfen, and Johannes Morgenstern, Pirna-Copitz, all of Germany, assignors to VEB Filmfabrik Wolfen, Wolfen, Fed. Rep. of Germany

Filed Dec. 21, 1976, Ser. No. 753,145

Int. Cl.[2] G03C *1/28, 1/34*

U.S. Cl. 96—107 **7 Claims**

1. A process for the stabilization and anti-fogging of a photographic silver halide emulsion including chemical sensitization and coating of said emulsions onto a support, characterized in that a stabilizing and anti-fogging amount of at least one compound represented by the general formula:



is added to said emulsion, wherein

R^1 represents a member selected from the group consisting of alkyl, alkenyl, cycloalkyl and aralkyl, either unsubstituted or substituted by one or multiple substituents selected from the group consisting of halogen, hydroxy, alcoxy, acyloxy, carboxy, alcoxycarbonyl and cyano;

or an aryl selected from the group consisting of phenyl and napthyl, either unsubsituted or substituted by one or multiple substituents selected from the group consisting of halogen, hydroxy, alcoxy, acyloxy, carboxy, alcoxycarbonyl, cyano, alkyl, cycloclkyl phenyl, napthyl, amino, nitro and sulfo;

R^2 represents a member selected from the group consisting of alkyl, alkenyl and aralkyl, either unsubstituted or substituted by one or multiple substituents selected from the group consisting of halogen, hydroxy, carboxy, and cyano; or an aryl selected from the group consisting of phenyl and napthyl, either unsubstituted or substituted by one or multiple substituents selected from the group consisting of halogen, hydroxy, alcoxy, acyloxy, carboxy, alcoxycarbonyl, carbonamido, cyano, alkyl, cycloalkyl, aryl, amino, acylamino, nitro and sulfo.

4,131,471

SYNTHETIC POLYMERIC SILVER HALIDE PEPTIZER

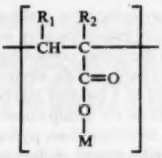
Maurice J. Fitzgerald, Canton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 638,820, Dec. 8, 1975, abandoned, which is a continuation-in-part of Ser. No. 532,165, Dec. 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 337,433, Mar. 2, 1973, abandoned. This application Jun. 13, 1977, Ser. No. 805,863

Int. Cl.[2] G03C *1/72*

U.S. Cl. 96—114 28 Claims

1. A photosensitive silver halide emulsion wherein the silver halide grains have absorbed on their surface a substantially continuous layer of an emulsion peptizer consisting essentially of a water soluble film-forming polymeric silver halide grain-growing protective colloid having in its structure at least about one mole percent repeating units of the formula



wherein R_1 is hydrogen, a lower alkyl group comprising a 1–4 carbon atom group, or halogen; R_2 is hydrogen, a lower alkyl group comprising a 1–4 carbon atom group, a halogen or cyano group; M is $—CH_2Z$ or $—CHY_2$ where Z is $—CX_3$, $—(CF_2)_rCF_3$ or $—(CF_2)_sH$ where X is —Br, —Cl or —F, r is 1–8 and s is 1–9; and Y is $—CH_2X$ or $—CX_3$, and at least one of R_1, R_2, or M comprises a halogen.

4,131,472

METHOD FOR INCREASING THE YIELD OF BATCH PROCESSED MICROCIRCUIT SEMICONDUCTOR DEVICES

James L. MacDonald, Jr., Sherman Oaks, and Richard A. Mink, Northridge, both of Calif., assignors to Align-Rite Corporation, Burbank, Calif.

Filed Sep. 15, 1976, Ser. No. 723,333

Int. Cl.[2] G03C *5/00, 5/04*

U.S. Cl. 96—38.3 5 Claims

1. Method of improving the yield of batch processed microcircuit semiconductor devices, comprising the steps of:

producing a master photomask for each layer of a semiconductor microcircuit, each said photomask comprising a plurality of identical dies imprinted upon a transparent plate covering said plate with said identical die images disposed in a dimensionally controlled matrix;

photographically marking each die in said matrix with unique indicia;

producing from each said master photomask a working plate, using such working plates for all required layers of the device to produce a batch of semiconductor devices, inspecting such devices, and recording the indicia of all defective devices;

inspecting the individual dies of the master photomasks indicated by such recorded indicia and repairing those dies found to be defective, then producing from said repaired master photomasks new working plates, and using such plates to produce further batches of semiconductor devices.

4,131,473

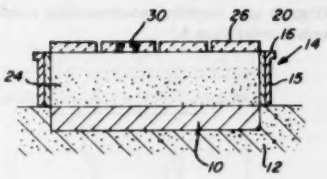
METHOD OF FORMING A HIGH-TEMPERATURE ABRASION-RESISTANT COATING ON A FERROUS METAL SUBSTRATE, AND RESULTING ARTICLE

Robert H. Kachik, Washington Township, Westmoreland County, and Arthur J. Pignocco, Franklin Township, Westmoreland County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 332,987, Feb. 15, 1973. This application Sep. 4, 1974, Ser. No. 503,202

Int. Cl.[2] C09D *5/38*

U.S. Cl. 106—1.12 4 Claims



1. A composition mixture for exothermically depositing a hard facing metallic layer onto a metallic substrate, consisting essentially of an exothermic fuel powder selected from the group consisting of aluminum, magnesium, calcium, silicon, and mixtures thereof; a particulate matrix forming material selected from the group consisting of Fe_2O_3, Fe_3O_4, Cr_2O_3 and mixtures thereof; and a boron containing material selected from the group consisting of boric oxide, ferroboron and mixtures thereof in an amount sufficient to yield from 4 to 7% boron in the hard facing metallic layer.

4,131,474

MOLDING SAND MIXTURES

Hiroshi Uchikawa, Funabashi, and Hajime Kato, Yokohama, both of Japan, assignors to Onoda Cement Company, Ltd., Yamaguchi, Japan

Continuation of Ser. No. 604,022, Aug. 12, 1975, abandoned. This application Jun. 8, 1977, Ser. No. 804,731

Int. Cl.[2] B28B *7/34*

U.S. Cl. 106—38.35 6 Claims

1. A molding sand mixture comprising 100 weight parts of molding sand and a mixture containing

(a) from 2–20 weight parts of a rapid hardening cement selected from the group consisting of:

(i) calcium aluminate containing rapid hardening cement prepared by blending Portland cement, fly ash cement, blast furnace cement or silica cement with a mixture consisting of 3–96% by weight of anhydrous gypsum and a ground amorphous glass of calcium aluminate consisting of 20–80% CaO and 80–20% Al_2O3;

(ii) a calcium aluminate rapid hardening cement prepared by blending Portland cement, fly ash cement, blast furnace cement or silica cement with a mixture of 3–96% by weight of anhydrous gypsum and crystals of calcium aluminate consisting of $CaO.2Al_2O_3$, $CaO.Al_2O_3$, 12 CaO.7 Al_2O_3 or mixture thereof;

(iii) a calcium haloaluminate containing rapid hardening cement prepared by

adding anhydrous gypsum to clinker powder consisting of $3CaO.SiO_2$ solid solution, $2CaO.SiO_2$ solid solution and $2CaO.Fe_2O_36CaO.2Al_2O_3.Fe_2O_3$ solid solution, and calcium haloaluminate having the formula 11 CaO.7 $Al_2O_3.CaX_2$ where X is halogen and wherein the Al_2O_3/SO_3 mole ratio in the cement is 0.5–2.0; and

(iv) mixtures thereof;

(b) 3–15 weight parts of water;

(c) from 0.01–1.0 weight parts of a polymeric water holding agent or from 0.03–2.0 weight parts of a polymeric water reducing agent; and

(d) from 0.01–3.0 parts by weight of lime;

wherein said polymeric water holding agent is methylcellulose, polyvinyl alcohol, alginic acid, sodium alginate, polyethylene oxide, or a water-soluble melamine resin;

wherein said polymeric water reducing agent is naphthalenesulfonic acid formalin condensation product, an alkylnaphthalenesulfonic acid-formalin condensation product, an alkylnaphthalenesulfonic acid-naphthalenesulfonic acid-formalin copolycondensate, a polycondensate salt of alkylaldehyde and creosote oil fractionated at a b.p. of from 200° to 315° C. (55% of creosote oil), or a water-soluble melamine resin, wherein the number of naphthalene rings in said naphthalene-containing condensation products is more than 5.

4,131,475

FABRICATION OF SHELL INVESTMENT MOLDS

Paul S. Svec, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 591,168, Jun. 27, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,854

Int. Cl.² B28B *7/34*

U.S. Cl. 106—38.3 **10 Claims**

1. An investment mold suitable for the casting and solidification of a superalloy therein comprising:

a plurality of first layers of a first type alumina-silica coating material disposed one upon the other;

at least a portion of one surface of one of the first layers defining at least one cavity in the mold for the casting of a melt of metal therein;

the first type coating material is derived from a mixture of three different fused alumina flour grain sizes 70–75% by weight of the mixture of 240 mesh; 10–20% by weight of the mixture of 320 mesh, and the remainder 400 mesh, wherein the alumina to silica ratio, in weight percent, upon final firing of the mold is from about 88:12 to about 95:5;

a plurality of second layers of a second type alumina-silica coating material disposed upon each other and upon the pluraity of first layers, to strengthen the mold, and

a sand coat of a fused alumina material disposed between and binding together mutually adjacent coating material layers.

4,131,476

ADDITIVE FOR GREEN MOLDING SAND

Ronald E. Melcher, and Frederick W. Schaefer, both of Madison, N.J., assignors to Whitehead Brothers Company, Florham Park, N.J.

Filed Aug. 5, 1977, Ser. No. 822,265

Int. Cl.² B28B *7/34*

U.S. Cl. 106—38.35 **16 Claims**

1. A method for imparting improved hot sand properties to a green molding sand consisting essentially of sand, clay as a binder and moisture which comprises admixing said sand, clay and moisture with at least one salt selected from the group consisting of a lithium or a magnesium salt of a lower alkanoic acid in an amount sufficient to impart improved hot sand properties to said green molding sand.

4,131,477

MOULDING COMPOSITION FOR MAKING FOUNDRY MOULDS AND CORES

Naum Y. Kagan, 2 ulitsa Mariinoi roschi, 14, kv. 48; Vladimir M. Bortnik, Eiskaya ulitsa, 8/29, kv. 36; Isai V. Korenbljum, Veernaya ulitsa, 3, korpus 4, kv. 112, all of Moscow; Jury A. Razumeev, Novomytischinsky prospekt, 39, kv. 1, Mytischi Moskovskoi oblasti; Abram M. Lyass, Sharikopodshipnikovskaya ulitsa, 2, kv. 42, Moscow; Pavel A. Borsuk, Nizhne-Pervomaiskaya ulitsa, 59, kv. 10, Moscow; Zokhrab G. O. Usubov, B. Cherkizovskaya ulitsa, kvartal 8-11, korpus 21, kv. 106, Moscow, and Valentina A. Dmitrieva, ulitsa Trofimova, 25, kv. 43, Moscow, all of U.S.S.R.

Continuation of Ser. No. 672,721, Apr. 1, 1976, abandoned, which is a continuation of Ser. No. 577,785, May 15, 1975, abandoned, which is a continuation of Ser. No. 439,980, Feb. 6, 1974, abandoned. This application Feb. 9, 1977, Ser. No. 767,032

Int. Cl.² B28B *7/34*

U.S. Cl. 106—38.35 **43 Claims**

1. A moulding composition for making self-setting foundry moulds and cores comprising foundry sand as a filler; a substance selected from the group consisting of ligno-sulphonates of alkali metals, alkali earth metals, ammonium and mixtures of said ligno-sulphonates as a binding ingredient; and a phenolic compound selected from the group consisting of phenol, pyrocatechin, resorcinol, hydroquinone, pyrogallol, phloroglucine, oxyhydroquinone, ortho-cresol, metal-cresol, para-cresol, and mixtures thereof as an additive.

4,131,478

SEALING GLASS COMPOSITIONS AND METHOD

Earl K. Davis, Tempe, and Kent W. Hansen, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 26, 1977, Ser. No. 828,017

Int. Cl.² C03C *3/10*

U.S. Cl. 106—53 **2 Claims**

1. A non-devitrifying sealing glass composition consisting essentially of about 85–91 weight percent of solder glass and about 15–9 weight percent of Al_2O_3 wherein the solder glass consists essentially of by weight: SiO_2 about 3 percent, PbO about 66 percent, PbF_2 about 5 percent, ZnO about 9 percent, CdO about 5 percent and B_2O_3 about 12 percent.

4,131,479

TRANSPARENT CERAMICS

Noboru Ichinose, Yokohama; Hideo Ookuma, Kawasaki; Toshiaki Mizutani, Yokohama, and Hideaki Hiraki, Kawasaki; all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Mar. 8, 1977, Ser. No. 775,468

Claims priority, application Japan, Mar. 8, 1976, 51-24217; Jul. 14, 1976, 51-82920; Jul. 14, 1976, 51-82921; Jan. 25, 1977, 52-6428; Jan. 25, 1977, 52-6429

Int. Cl.² C04B *35/00*

U.S. Cl. 106—39.5 **2 Claims**

1. A transparent, single phase, complex oxide ceramic material of the formula $(Sr_{1-x}Ca_x)(Li_{\frac{1}{4}}Nb_{\frac{3}{4}})O_3$ wherein x is 0.01–0.50.

4,131,480

PUMPABLE CEMENTITIOUS COMPOSITIONS

Lawrence H. McCurrich, Chesham, and Steven A. Lammiman, Hemel Hempstead, both of England, assignors to Fosroc Holdings (U.K.) Limited, England

Filed Mar. 16, 1977, Ser. No. 778,276

Int. Cl.² C04B *7/02*

U.S. Cl. 106—93 **16 Claims**

1. In a cement composition comprising a hydraulic cement, water and a porous light weight aggregate, the improvement comprising adding to said composition 0.001% to 0.04% by weight of said composition of a dispersing agent, 0.001% to 0.04% of a gelling agent and an effective amount of a plasti-

cizer with said improvement reducing the absorption of water by said aggregate such that said composition with said improvement can be readily pumped under high pressure.

4,131,481
POLYMER COMPOSITION

Paul H. Drake, London; Colin J. Humphris, West Ewell, and John E. Preedy, Croydon, all of England, assignors to The British Petroleum Company Limited, London, England

Filed Mar. 22, 1977, Ser. No. 780,275

Claims priority, application United Kingdom, Apr. 7, 1976, 14081/76

Int. Cl.² C04B *21/02*

U.S. Cl. 521—91 **11 Claims**

1. A structural foam material comprising the foamed reaction product of the paste-like cement mass obtained upon mixing an ion-leachable glass selected from the group consisting of an aluminosilicate and a fluoroaluminosilicate with a polycarboxylic acid in the presence of water.

4,131,482
CONTINUOUSLY OPERATING SUGAR CENTRIFUGE

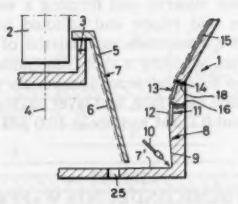
Walter Dietzel, Braunschweig, Fed. Rep. of Germany, assignor to Braunschweigische Maschinenbauanstalt, Braunschweig, Fed. Rep. of Germany

Filed Apr. 25, 1977, Ser. No. 790,613

Claims priority, application Fed. Rep. of Germany, May 5, 1976, 7614228[U]

Int. Cl.² C13F *1/10*

U.S. Cl. 127—19 **9 Claims**



1. In a basket structure for a continuously operating sugar centrifuge into which massecuite is continuously supplied by feeding and accelerating means including a preseparating stage and a further separating stage, the improvement comprising washing stage means arranged between said preseparating stage and said further separating stage, said washing stage means comprising three zones including a juicing-up zone, an intermediate zone and a separating zone, arranged in that order as viewed in the flow-direction of the material being centrifuged, said juicing-up zone having impermeable and unperforated wall means with a radial spacing from said preseparating stage, said intermediate zone comprising first separating screen means with an open screening area of maximal 2% of its total area, said separating zone comprising wall means having a radially outward inclination of up to 10° relative to the vertical, whereby the separating zone has an outwardly flaring upper end, said separating zone further comprising second screen means having a maximum of open area relative to its total area, said upper end of said separating zone merging into said further separating stage, and washing liquid supply means operatively arranged for feeding washing liquid into said juicing-up zone.

4,131,483
METHODS FOR CLEANING ARTICLES WITH UPWARD FLOWING LIQUIDS

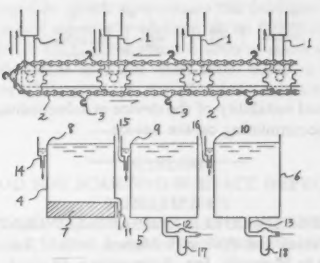
Shunji Iwahashi, Shinsenrikita; Masahiro Yamasaki, Ibaraki, and Takanori Fujita, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 27, 1977, Ser. No. 801,313

Claims priority, application Japan, May 28, 1976, 51-62557; Jun. 1, 1976, 51-64965

Int. Cl.² B08B *3/12*

U.S. Cl. 134—1 **6 Claims**



1. A method for cleaning synthetic resin articles, which comprises (1) carrying the articles into a cleaning zone where they are contacted with an aqueous detergent solution which is allowed to flow upward and to which an ultrasonic wave is applied, (2) carrying the articles from the cleaning zone to a rinsing zone where they are contacted with warm water which is allowed to flow upward, (3) carrying the articles from the rinsing zone to a dipping zone where they are contacted with additional fresh warm water which is allowed to flow upward, and then (4) pulling the articles up slowly from the dipping zone to drain off the water attached to the articles, the average rates of the upward flow in steps (1), (2), and (3) being 5 to 500 mm/min, 100 to 1000 mm/min and 50 to 500 mm/min, respectively.

4. A method for cleaning synthetic resin articles, which comprises (1) carrying the articles into a cleaning zone where they are contacted with an aqueous detergent solution which is allowed to flow upward and to which an ultrasonic wave is applied, (2) carrying the articles from the cleaning zone to a rinsing zone where they are contacted with warm water which is allowed to flow upward, (3) carrying the articles from the rinsing zone to a dipping zone where they are contacted with additional fresh water which is allowed to flow upward, and then (4) pulling the articles up slowly from the dipping zone to drain off the water attached to the articles, the rate of pulling being 20 to 30 cm/min at a warm temperature of 60° to 70° C.

4,131,484
FREQUENCY ADJUSTING A PIEZOELECTRIC DEVICE BY LASERING

Robert D. Caruso, Salem, N.H., and Gerald A. Setter, Jr., West Seneca, N.Y., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 13, 1978, Ser. No. 877,541

Int. Cl.² B08B *7/02*; B23K *31/10*; H04R *17/10*

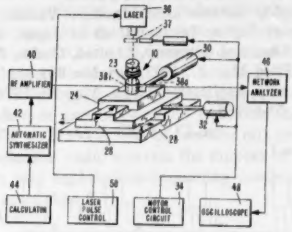
U.S. Cl. 134—1 **10 Claims**

1. A method of adjusting the resonant frequency of a piezoelectric device, which comprises:

laser machining electrode material from the piezoelectric device to change the resonant frequency of the device to a nominal value; and

simultaneously electronically cleaning the piezoelectric device by overdriving the device at a high current level in

comparison to the current level at which the device normally is operated, to prevent lasered particles which cause



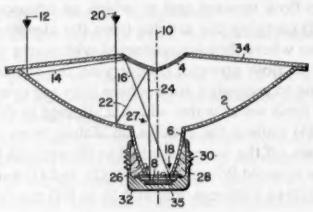
electrical instability of the device in subsequent operation from accumulating on the device.

4,131,485

SOLAR ENERGY COLLECTOR AND CONCENTRATOR

Aden B. Meinel, and Walter B. Meinel, both of Tucson, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 822,583, Aug. 8, 1977, abandoned. This application Mar. 6, 1978, Ser. No. 883,558
Int. Cl.[2] H01L *31/04;* F24J *3/02*
U.S. Cl. 136—89 PC **33 Claims**



1. An apparatus for collecting energy from a remote electromagnetic radiation source, the apparatus having a cross section generally symmetrical about an axis, a cross section of the apparatus comprising in combination:

first reflective means for collecting and reflecting the energy from the remote source, said first reflective means being concave and having a shape generally of a conic section, said first conic section shape having an axis substantially coincident with the axis of the apparatus, said first reflective means having an aperture around said apparatus axis;

second reflective means spaced from said first reflective means for collecting said energy reflected from said first reflective means and for further reflecting the energy through said aperture in said first reflective means, that portion of said second reflective means lying on one side of the axis of the apparatus and facing said first reflective means being convex and having a shape generally of a conic section, said second conic section shape having an axis being angularly displaced from the axis of the apparatus; and

receiving means for absorbing said further reflected energy, a nominal ray crossover point of said further reflected energy being between said second reflective means and said receiving means, said receiving means being positioned to receive said further reflected energy through said aperture in said first reflective means, said further reflected energy being thereby dispersed generally over said receiving means.

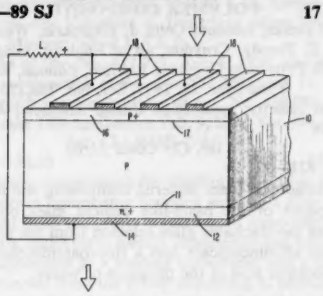
11. The apparatus according to claim 1 wherein said receiving means comprises a photovoltaic cell.

4,131,486

BACK WALL SOLAR CELL

Henry W. Brandhorst, Jr., Berea, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation-in-part of Ser. No. 760,771, Jan. 19, 1977, abandoned. This application Apr. 24, 1978, Ser. No. 899,123
Int. Cl.[2] H01L *31/06*
U.S. Cl. 136—89 SJ **17 Claims**



1. An energy converter for the conversion of radiant energy to electrical energy comprising

a first semiconductor material of one conductivity type having a face for receiving said radiant energy and an oppositely disposed back face, said first semiconductor material having a thickness between about 5 μM and about 500 μM,

a region of a semiconductor material of said one conductivity type along said energy receiving face and forming a first interface with said first semiconductor material, said region having a greater surplus of majority carriers and therefore being of greater conductivity than said first semiconductor material, said region having a thickness of between about 0.1 μM and about 10.0 μM and

a layer of second material on said back face of said first semiconductor material and forming a second interface remote from said region and selected from a metallic material and a semiconductor material of opposite conductivity type, whereby a rectifying junction is formed between said first and second materials at said second interface at said back face, said layer having a thickness of between about 0.1 μM and about 10.0 μM.

4,131,487

GETTERING SEMICONDUCTOR WAFERS WITH A HIGH ENERGY LASER BEAM

Charles W. Pearce, Emmaus, Pa., and Vincent J. Zaleckas, Union, N.J., assignors to Western Electric Company, Inc., N.Y.

Filed Oct. 26, 1977, Ser. No. 846,222
Int. Cl.[2] H01L *21/265*
U.S. Cl. 148—1.5 **2 Claims**

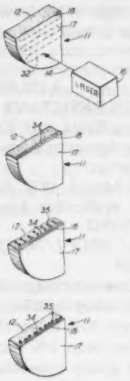
1. A method of making semiconductor devices in one surface of a wafer, which includes at least two diffusion and simultaneous heating steps, comprising:

directing a laser beam on the opposite surface of the wafer so that such surface absorbs such beam to vaporize spots of the wafer and form shallow overlapping holes to produce lattice damage intensification and strain in the region of such surface, the laser beam being directed either before the diffusion and heating steps or between the two diffusion and heating steps or after the heating and diffusion steps;

scanning in a raster pattern such opposite surface with such beam while it is so directed to blanket said surface with the lattice damage intensification; and

heating the wafer at a temperature and for a time sufficient to produce a dislocation array adjacent to the region of damage intensification to relieve the strain and attract

mobile defects in the wafer toward the array and away from the surface of the wafer on which the devices are to be formed, the combination of the laser produced damage



intensification and heating contactlessly gettering the wafer to reduce defects in the semiconductor devices made from the wafer without contaminating the wafer.

4,131,488

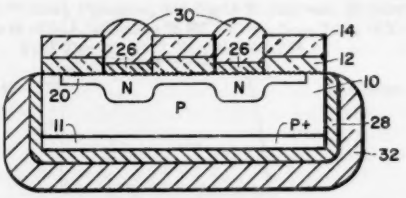
METHOD OF SEMICONDUCTOR SOLAR ENERGY DEVICE FABRICATION

Israel A. Lesk, Scottsdale, and Robert A. Pryor, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 645,600, Dec. 31, 1975, abandoned. This application Apr. 25, 1977, Ser. No. 792,438

Int. Cl.[2] H01L *21/263, 31/04*

U.S. Cl. 148—1.5 **11 Claims**



1. A process for forming a semiconductor solar energy device comprising the steps of:

providing a silicon wafer of a first conductivity type with two major surfaces;

introducing a doping impurity of said first conductivity type into both major surfaces simultaneously;

forming an oxide layer on both major surfaces following the introduction of said doping impurities;

removing said oxide layer from a first major surface of said wafer;

treating said first major surface to form a textured pyramidal surface structure while masking a second major surface opposite said first major surface from said texture treating;

forming a thin layer of silicon dioxide in contact with said first major surface;

forming a thin layer of silicon nitride on said layer of silicon dioxide to form an antireflective coating; and

forming a shallow layer of semiconductor material of a second conductivity type opposite said first conductivity type of said first major surface.

4,131,489

CHROMATE CONVERSION COMPOSITION AND METHOD FOR COATING ALUMINUM USING LOW CONCENTRATIONS OF CHROMATE, PHOSPHATE AND FLUORIDE IONS

Nelson J. Newhard, Jr., Plymouth Meeting, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Filed Mar. 31, 1978, Ser. No. 892,376

Int. Cl.[2] C23F *7/26*

U.S. Cl. 148—6.16 **16 Claims**

1. An aqueous acidic solution, for coating the surface of a metal selected from the group consisting of aluminum and alloys thereof in which aluminum is the principal ingredient, which consists essentially of from about 0.005 to about 0.2 grams/liter of CrO_3, from about 0.02 to to about 0.4 grams/-liter of phosphate ion, and from about 0.005 to about 0.04 grams/liter of fluoride ion, the pH of the solution being less than about 3.5.

4,131,490

METHOD FOR SCARFING SURFACE DEFECTS OF A METAL PIECE

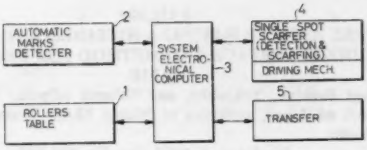
Akiyoshi Oishi; Tamotsu Harada, and Takashi Ishikawa, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 27, 1975, Ser. No. 590,806

Claims priority, application Japan, Jul. 1, 1974, 49-74322

Int. Cl.[2] B23K *7/06*

U.S. Cl. 148—9.5 **9 Claims**



1. A method of treating defects on or beneath the surface of a metal piece comprising the steps of:

(a) marking directly on the surface of the metal piece with patterns formed by assigned colored marks of a specific size and shape which represent the position extent, type and depth of the defects;

(b) optically detecting the colored marks with a mark detector;

(c) storing the detected marks into an electronic computer as a metal surface image on a mesh configuration, the computer being able to recognize the position, extent, type and depth of the surface defects from the stored metal image;

(d) electronically correcting for transverse shifts and editing the stored marks into unit scarfing areas;

(e) electronically calculating an optimum scarfing depth for each scarfing area;

(f) supplying the edited and calculated information to a scarfing machine to permit automatic scarfing of the surface detects.

4,131,491

TORSION BAR AND METHOD OF FORMING THE SAME

George L. Joseph, Morgan Hill, Calif., assignor to FMC Corporation, San Jose, Calif.

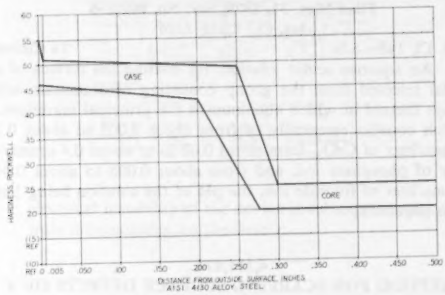
Filed Dec. 22, 1977, Ser. No. 863,558

Int. Cl.[2] C21D *1/10, 7/04, 9/00*

U.S. Cl. 148—12 B **44 Claims**

1. A method of forming a torsion bar having an outer case and a core from a steel alloy bar of the desired size and shape and with a medium carbon content, or a steel bar having similar hardenability characteristics; comprising the steps of through hardening the bar to a predetermined hardness, case

hardening the bar for transforming austenite in the case into martensite which expands inducing a high compressive stress near the surface of the bar with the compressive stresses diminishing radially inward to the center of the bar, retaining the core at a temperature below the transformation temperature for resisting expansion of both the case and the core and for



inducing hoop and axial compressive stresses and radial tensile stresses in the case, and presetting the hardened bar by cold working the bar at least twice by applying sufficient torsional stresses on the bar for twisting the bar beyond its initial yield strength causing a redistribution of stresses and inducing residual torsional stresses in the case and in the core in a direction opposite to the direction of the applied torque.

4,131,492

STEEL ARTICLE HAVING A NITRIDED AND PARTLY OXIDIZED SURFACE AND METHOD FOR PRODUCING SAME

Shingi Fushimi, Yokosuka, and Takeshi Miyata, Yokohama, both of Japan, assignors to Nissan Motor Company, Ltd., Japan

Filed Apr. 6, 1977, Ser. No. 785,235
Claims priority, application Japan, Apr. 8, 1976, 51/38806
Int. Cl.² C23C *11/16*
U.S. Cl. 148—16.6 **5 Claims**

1. A method of hardening a steel article which is to be mated with a separate article so as to make face-to-face contact, said article having good wear resistance and smoothly fitting the separate article substantially from the start of use, the method comprising:

a. heating said steel article in an ammonia gas atmosphere containing less than 1% by volume of oxygen;

b. continuing heating of the steel article at a temperature of 450 to 650° in an ammonia gas atmosphere containing from 1 to 10% by volume of oxygen so that a surface region of the steel article is nitrided, with the formation of an oxidized layer as an outermost part of the nitrided layer.

4,131,493

FLUX-CORED WELDING WIRE

Samuil M. Gurevich, Bulvar Lesi Ukrainki, 2, kv. 2; Vadim N. Zamkov, Bulvar Lesi Ukrainki, 2, kv. 8, and Valery P. Prilutsky, ulitsa Nikolsko-Botanicheskaya, 15/17, kv. 4, all of Kiev, U.S.S.R.

Filed Dec. 20, 1974, Ser. No. 534,724
Claims priority, application U.S.S.R., Jan. 22, 1974, 1990025
Int. Cl.² B23K *35/34*
U.S. Cl. 148—23 **8 Claims**

1. A fluxed-core wire for inert-gas shielded fusion welding of titanium and its alloys, comprising a tubular casing made of a metal selected from a group including titanium and its alloys and a powder flux core consisting essentially of (percent by weight):

CaF_2 — 40 to 50,

BaF_2 — 5 to 10,

a fluoride of a rare-earth element — 18 to 20, and

SrF_2 — the rest,

the ratio of the weight of the powder flux to the total weight content of titanium in said wire being from about 0.3:1 to 1:1.

4,131,494

CORROSION RESISTANT MAGNETIC ALLOY

Kenichiro Momose, Ebina, and Kiyoshi Kumagai, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 4, 1977, Ser. No. 774,500
Claims priority, application Japan, Mar. 8, 1976, 51/24234; Jul. 28, 1976, 51/89042
Int. Cl.² H01F *1/14*; C22C *38/42, 38/52*
U.S. Cl. 148—31.57 **3 Claims**

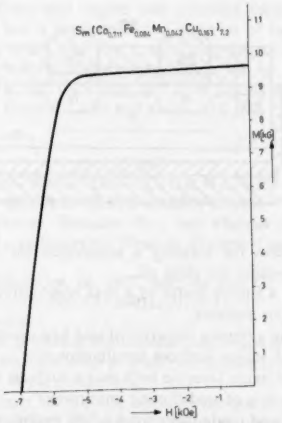
1. A corrosion resistant magnetic alloy with high magnetic permeability, said alloy consisting essentially of Ni in an amount ranging from 30% to less than 35% by weight, Cr in an amount ranging between 8% and 12% by weight, a metal selected from the group consisting of Co, Cu and mixtures thereof, and the balance of essentially Fe, the Co content when present ranging between 2% and 5% by weight and the Cu content when present between 1% and 5% by weight, the initial magnetic permeability of said alloy being at least 1000 and the flux density under a magnetic intensity of 10 oersteds.

4,131,495

PERMANENT-MAGNET ALLOY

Anton Menth, Nussbaumen; Hartmut Nagel, Wettingen, and Ulrich Spinner, Aeugst, all of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Nov. 30, 1976, Ser. No. 746,226
Claims priority, application Switzerland, Dec. 2, 1975, 15631/75
Int. Cl.² H01F *1/04, 1/14, 7/02*
U.S. Cl. 148—31.57 **4 Claims**



1. A permanent magnet alloy selected from the group consisting of

$$RE\ (Co_{1-u-w-y}Fe_uCr_wCu_y)_z$$

wherein RE is samarium, cerium, cerium mischmetal (MM), praseodymium, neodymium, lanthanum or mixtures thereof and

$0.05 < u < 0.13$

$0.02 < w < 0.05$

$0.10 < y < 0.18$

$7.0 < z < 7.5$

which has been prepared by the process which comprises melting and casting said alloy from starting materials followed by homogenization heat-treating the alloy of the molten and cast starting materials at a temperature just above the solidus temperature or in the temperature range in which the non-RE and non-Co components of the alloy have their maximum solubility in the RE_2Co_{17} mixed crystals; crushing and grinding the alloy to a particle size of from 2 μm to 10 μm; magnetically aligning the resultant powder; isostatically compressing the resultant powder; sintering the resulting briquette just below the solidus temperature; and finally annealing the alloy at a temperature between 700° C. and 900° C.

3. A process for preparing a permanent magnet alloy selected from the group consisting of

$$RE\ (Co_{1-u-w-y}Fe_uCr_wCu_y)_z$$

wherein RE is samarium, cerium, cerium mischmetal (MM), praseodymium, neodymium, lanthanum or mixtures thereof and

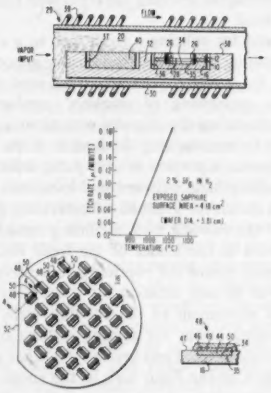
$0.05 < u < 0.13$
$0.02 < w < 0.05$
$0.10 < y < 0.18$
$7.0 < z < 7.5$

which comprises melting and casting said alloy from starting materials followed by homogenization heat-treating the alloy of the molten and cast starting materials at a temperature just above the solidus temperature or in the temperature range in which the non-RE and non-Co components of the alloy have their maximum solubility in the RE_2Co_{17} mixed crystals; crushing and grinding the alloy to a particle size of from 2 μm to 10 μm; magnetically aligning the resultant powder; isostatically compressing the resultant powder; sintering the resultant briquette just below the solidus temperature; and finally annealing the alloy at a temperature between 700° C. and 900° C.

4,131,496
METHOD OF MAKING SILICON ON SAPPHIRE FIELD EFFECT TRANSISTORS WITH SPECIFICALLY ALIGNED GATES

Charles E. Weitzel, Princeton, and David R. Capewell, Browns Mills, both of N.J., assignors to RCA Corp., New York, N.Y.

Filed Dec. 15, 1977, Ser. No. 860,855
Int. Cl.² H01L *21/86, 27/12*
U.S. Cl. 148—175 **11 Claims**



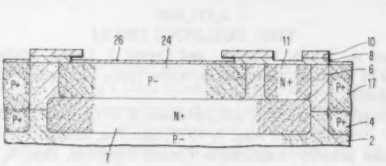
1. A process for manufacturing field effect transistors on an insulating substrate selected from the group consisting of sapphire, spinel and beryllium oxide; comprising:

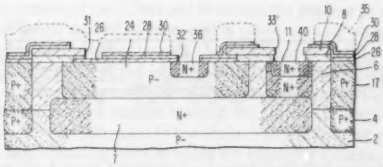
(a) depositing a mask comprising a layer of silicon nitride directly on an exposed surface of said insulating substrate;
(b) defining an aperture in said mask to expose portions of the underlying insulating substrate;
(c) exposing said mask and said exposed portions of said insulating substrate to a gas mixture comprised of sulfur hexafluoride gas and a carrier gas at a temperature less than 1050° C. for a time period sufficient to form blind holes in said insulating substrate;
(d) epitaxially growing silicon in said blind holes; and
(e) forming field effect transistors in said epitaxially grown silicon, the gates of said field effect transistors being aligned orthogonal to the projection of the "c" axis on the "r" plane of said insulating substrate.

4,131,497
METHOD OF MANUFACTURING SELF-ALIGNED SEMICONDUCTOR DEVICES

Bai-Cwo Feng, Wappingers Falls, and George C. Feng, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 12, 1977, Ser. No. 814,829
Int. Cl.² H01L *23/306, 21/265*
U.S. Cl. 148—187 **32 Claims**





8. A method for forming an impurity region in a semiconductor substrate comprising the steps of:

forming a first masking layer atop said substrate, said layer including lower and upper materials which are selectively etchable with respect to each other;
etching a first window within said first masking layer so as to cause a portion of said upper material to overhang said lower material at the periphery of said first window;
forming a second masking layer atop said substrate within said first window so as to fill-in said overhang, said layer including lower and upper materials which are selectively etchable with respect to each other;
said upper material of said second masking layer covering at least the portion of said upper material of said first masking layer at the periphery of said first window;
said upper materials being etchable by the same etchant;
etching at least a second window through said upper and lower materials of second masking layer, said material at said periphery acting as a mask; and
introducing an impurity through said second window into said substrate to form said impurity region.

4,131,498

METALLIC SPONGE INCENDIARY COMPOSITIONS

Carl F. Lucy, Albany, Oreg., assignor to Teledyne Industries, Inc., Albany, Oreg.

Filed Jan. 25, 1978, Ser. No. 872,167
Int. Cl.[2] C06B *45/00*
U.S. Cl. 149—2 5 Claims

1. An incendiary composition comprising teflon and a metal sponge selected from the group consisting of zirconium and hafnium.

4,131,499

LOW SMOKE PROPELLANT

David A. Flanigan, Huntsville, Ala., assignor to Thiokol Corporation, Newtown, Pa.

Continuation-in-part of Ser. No. 720,532, Sep. 7, 1976. This application Jun. 8, 1977, Ser. No. 804,683
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.3 7 Claims

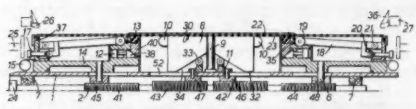
1. A low smoke propellant composition which comprises:
(a) a nitramine,
(b) a solid binder component based on a hydroxy or carboxy substituted perfluorocarbon powder, and which is substantially free of metallic fuel.

4,131,500

TIRE BUILDING DRUM

Michael A. Wilde, Winsley, and David J. Lucas, Melksham, both of England, assignors to Avon Tyres Limited, Wiltshire, England

Continuation of Ser. No. 638,854, Dec. 8, 1975, abandoned. This application Aug. 3, 1977, Ser. No. 821,418
Claims priority, application United Kingdom, Dec. 9, 1974, 53219/74
Int. Cl.[2] B29H *17/12*
U.S. Cl. 156—131 14 Claims



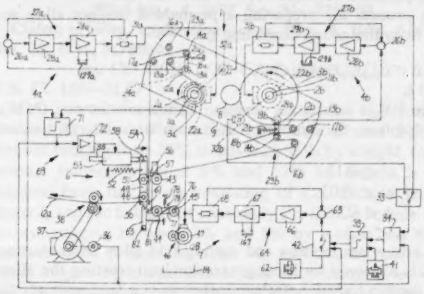
1. A tyre building drum for building a stage-I carcass of a tyre which comprises:
a circumferential ring of drum segments defining a cylindrical surface on which tyre components can be laid up,
a radial post disposed centrally of each of said segments upon which each of said segments can move radially and be guided during such radial movement so as to expand or contract the cylindrical surface;
an expansible ring at each end of the drum and means for expanding the rings to lock the components against surrounding beads; and
means arranged to expand the drum radially by movement of the drum segments radially outwardly upon said posts by at least 25% of the radius of the drum and substantially radially beyond the expanded bead ring each segment having a surface cooperating with the expanding means for enabling the segment to act radially against the components throughout the expansion movement, and each segment having a surface for holding the components axially outwards in the expanded state of the drum, and lash-back means arranged to lash-back the part of the components beyond the expansible rings by acting through the components against the holding surface.

4,131,501

METHOD AND APPARATUS FOR SPLICING RUNNING WEBS OF LOW TENSILE STRENGTH

Hubert Böttcher; Joachim Pfannmüller; Hartmut Kaebernick, all of Hamburg; Wolfgang Steiniger, Börnsen, and Horst-Dieter Preuss, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG., Fed. Rep. of Germany

Filed Dec. 1, 1977, Ser. No. 856,57[illegible]
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655791
Int. Cl.[2] B65H *19/08*
U.S. Cl. 156—157 18 Claims



1. A method of splicing a fresh web to a running web, particularly of splicing webs which are used in the manufacture and/or processing of smokers' products, comprising the steps of advancing the running web along a predetermined path; maintaining the leader of the fresh web at a location adjacent a portion of said path; placing a uniting band, both sides of which are adhesive, between said location and said portion of said path; gradually accelerating the fresh web to the speed of the running web, including applying to the leader of the fresh web a tensional stress ahead of the uniting band; confining successive increments of the fresh web at said location to movement in the general direction of movement of the running web; shifting at least one of the webs against the uniting band and toward the other web so that the uniting band connects the webs to each other and moves with the running web; severing the running web behind the moving uniting band; relaxing the tensional stress upon the fresh web ahead of the moving uniting band; and thereupon severing the fresh web ahead of the moving uniting band.

7. Apparatus for splicing a fresh web to a running web by means of a uniting band which is adhesive at both sides thereof, particularly for splicing webs which are used in the manufacture and/or processing of smokers' products, comprising means for advancing the running web along a predetermined path; means for maintaining the leader of the fresh web at a location adjacent a portion of said path; means for separably holding a uniting band between said location and said portion of said path; means for gradually accelerating the fresh web to the speed of the running web, including means for applying a tensional stress to the leader of the fresh web ahead of said holding means; means for confining successive increments of the fresh web at said location for movement in the general direction of movement of the running web; splice forming means including means for shifting at least one of the webs against the uniting band and toward the other web in response to acceleration of the fresh web to the speed of the running web so that the uniting band connects the webs to each other and moves with the running web; means for severing the running web behind the moving uniting band; means for relaxing the tensional stress upon the fresh web ahead of the moving uniting band; and means for thereupon severing the fresh web ahead of the moving uniting band.

4,131,502
METHOD OF LAMINATING ADHESIVE TO A PLURALITY OF SPACED FIBER STRIPS

Panchanan Mitra, Stapleford, England, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 26, 1977, Ser. No. 845,754

Claims priority, application United Kingdom, Nov. 6, 1976, 46267/76

Int. Cl.² B32B *5/00*

U.S. Cl. 156—179 **15 Claims**

1. A method of preparing ribbons of unidirectional fiber-reinforced plastics material comprising the steps of

i) laying, alternately, unidirectional fibers in a series of discrete parallel strips and a series of auxiliary strips onto a plastics material on a backing comprising a first continuous release sheet, wherein the auxiliary strips are different from said unidirectional fiber strips and serve to prevent the spreading of said unidirectional fiber strips and adhere to surplus resin between the unidirectional fiber strips,

ii) applying to the unidirectional fibers and auxiliary strips a second continuous release sheet,

iii) applying heat and pressure such that the plastics material flows about the unidirectional fibers to form a series of coherent ribbons,

iv) removing only one of the release sheets, and

v) removing the auxiliary strips from between the ribbons of unidirectional fiber-reinforced plastics material with the surplus plastics material adhering thereto without cutting the backing release sheet to form a release sheet with a plurality of spaced resin impregnated unidirectional fiber strips thereon.

4,131,503
METHOD AND APPARATUS FOR SEALING AND CUTTING THERMOPLASTIC MATERIAL

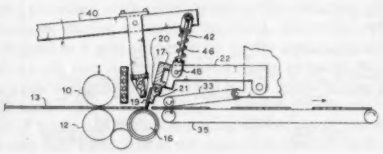
Gary G. Plate, Burlington, Canada, assignor to A.T.R. Equipment Industries Ltd., Mississauga, Canada

Continuation of Ser. No. 729,228, Oct. 4, 1976, abandoned. This application Apr. 3, 1978, Ser. No. 892,607

Claims priority, application Canada, Sep. 2, 1976, 260418

Int. Cl.² B32B *31/18, 31/20*

U.S. Cl. 156—250 **7 Claims**



2. A sealing-cutting mechanism for use in a bag-making machine for manufacturing bags from a thermoplastic material of flexible tubular stock comprising, in combination: a sealing roll mounted on said machine for intermittent rotation adapted to receive said stock thereon, a first pivot arm and a blade mounted on said first pivot arm for reciprocal movement of the blade onto and away from the stock on the roll, means for heating said blade, a second pivot arm and a sealing bar mounted on said second pivot arm for reciprocal movement of the sealing bar onto and away from the stock on the roll, means for heating said sealing bar, biasing means interconnecting said first and second pivot arms such that the blade is normally disposed lower than the sealing bar whereby downward actuation of the second pivot arm depresses the first pivot arm for sequential abutment of the blade and of the sealing bar on the stock, means for tensioning said stock material adapted to remove severed portions of stock material from the bag-making machine, and means for actuating said pivot arms for abutment of the blade when heated onto said stock material when said stock material is under tension for severing the stock material permitting removal of severed stock by said tensioning means and for sequential abutment of the sealing bar when heated onto the stock material against the sealing roll for sealing the severed edge of the stock material while said stock material is under no effective tension.

4,131,504
HAND LABELLER

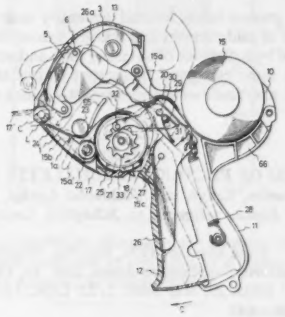
Akira Furutu, Tokyo, Japan, assignor to Japan Bano'K Co., Ltd., Tokyo, Japan

Filed May 24, 1977, Ser. No. 800,030

Claims priority, application Japan, Dec. 30, 1976, 52-176172[U]; Dec. 30, 1976, 52-176173[U]; Dec. 30, 1976, 52-176175[U]

Int. Cl.² B41F *1/28, 21/00*

U.S. Cl. 156—384 **16 Claims**



1. A hand labeller comprising a label sheet roll for supplying a label sheet having a label blank laminated on a carrier paper, a typing device for pressing said label sheet onto an anvil plate thereby to effect a typing on said label blank for each one of the successive label pieces, and labelling means for labelling the label carrying the typed information onto an object, wherein said labelling means include a labelling cam having a cut out or partially removed back, said labelling cam being allowed to swing reciprocatorily within such an angular range that said removed back does not interrupt the passage of an ink roller, wherein said label sheet roll is adapted to be supported by a supporting member passing through a bore formed therein between two walls of the labeller body, said supporting member having at least one slit extending from one axial end to an intermediate portion thereof toward the other axial end, and a retaining portion provided in the vicinity of the starting end of the slit, said retaining portion being for engaging a cooperating retaining portion formed on one wall of said labeller body to be located by the later, said slit being engaged by a projection formed in said wall of said labeller body thereby to prevent said supporting member from dropping from said labeller body.

4,131,505
ULTRA-SONIC HORN

Paul H. Davis, Jr., St. Charles, Ill., assignor to DuKane Corporation, St. Charles, Ill.

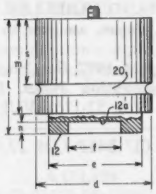
Filed Dec. 12, 1977, Ser. No. 859,919

Int. Cl.² B23K *1/06;* B29C *27/08*

U.S. Cl. 156—580.1 **11 Claims**

1. An ultrasonic transmitting member having an input at one end and an output at the other end, said member being of metal and dimensioned to operate at ½ wavelength resonance in the order of 20 kHz and having substantially throughout the length thereof transverse dimensions of from about 4 inches to about 7 inches, said member being adapted to normally transmit acoustic energy longitudinally thereof between input and output ends, said member having a peripheral groove at its outer side surface extending inwardly from such outer surface to

define the groove depth and said groove extending in planes transversely of the longitudinal axis of such member, said groove having its width in the direction of said longitudinal axis and its depth normal to the outer side surface of said member, said depth being between about ¼ inch and about ½



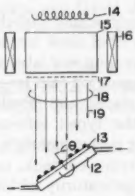
inch, said groove being located generally near or within the output half of said member and wholly spaced from the output end thereof by a distance of at least ¼ inch and acting to distribute output sonic energy at the output end of said member in substantial amplitude at the outermost regions of said output end.

4,131,506

METHOD OF PRODUCING ECHELETTE GRATINGS

Susumu Namba, Tokyo, and Yoshinobu Aoyagi, Kamifukuoka, both of Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Filed Dec. 15, 1976, Ser. No. 750,914
Claims priority, application Japan, Dec. 19, 1975, 50-151283
Int. Cl.[2] H01L *21/306;* **B44C** *1/22;* **C03C** *15/100, 25/06*
U.S. Cl. 156—643 **7 Claims**



1. A method of producing echelette gratings comprising the steps of:

using holographic masking techniques to produce a mask grating on a substrate;

rotating the masked substrate with respect to a source of a beam of charged particles to form a desired oblique angle between the beam and surface of the masked substrate;

projecting a beam of charged particles onto the masked substrate at the desired oblique angle to the surface of the substrate for eroding the substrate thereby leaving sawtooth parallel grooves in the substrate; and

water cooling the masked substrate while it is being eroded by the beam of charged particles.

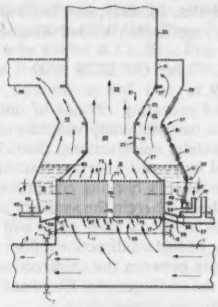
4,131,507

EVAPORATOR

Adolfo J. Morales, 6000 Leonardo St., Coral Gables, Fla.

Filed Feb. 15, 1977, Ser. No. 768,681
Int. Cl.[2] B01D *1/00*
U.S. Cl. 159—23 **1 Claim**

1. An evaporating apparatus including in combination, a source of hot waste gases, a heat transmitting area, a hot gas orienting means positioned between said source of hot waste gases and said heat transmitting area, said hot gases flowing through said orienting means and into said transmitting area, an evaporating area in heat transfer relationship with said transmitting area, and said heat transmitting area includes a lower generally bell shaped area, an upper generally inverted bell shaped area spaced from said lower bell shaped area and a central diametrically constricted area connecting said two first named areas, and the wall of said heat transmitting area being spaced from the outer wall of said evaporating area and the outer wall of said evaporating area conforming generally to the configuration of the upper generally inverted bell shaped



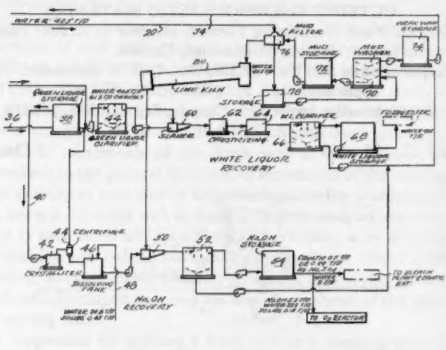
area, and the width of the upper portion of the evaporating area adjacent to the constricted area and of the lower bell shaped area of the heat transmitting area.

4,131,508

RECOVERY SYSTEM FOR OXYGEN BLEACHING OF PULP

Oliver A. Laakso, Glens Falls, N.Y., assignor to Kamyr Inc., Glen Falls, N.Y.

Filed Mar. 12, 1973, Ser. No. 339,760
Int. Cl.[2] D21C *11/04*
U.S. Cl. 162—30 K **3 Claims**



1. A method of digesting and then oxygen bleaching cellulosic fiber material in successive zones and subsequently regenerating white liquor for digesting and sufficient NaOH for oxygen bleaching so that no make-up source of NaOH for oxygen bleaching is necessary, said method comprising the steps of

(a) feeding spent liquor, including spent liquor from the oxygen bleaching zone and spent black liquor, to a green liquor recovery system,

(b) concentrating said spent liquor,

(c) burning said spent liquor to produce a smelt,

(d) dissolving said smelt to produce green liquor containing a solution of sodium carbonate, sodium sulfide, and dregs,

(e) feeding a first portion of said green liquor to a white liquor recovery system and subsequently treating said green liquor to recover white liquor therefrom,

(f) recycling said recovered white liquor to said digesting zone,

(g) feeding a second portion of said green liquor to an NaOH recovery system, and subsequently (i) treating said green liquor in a crystalizer to form sodium carbonate crystals,

(ii) separating said crystals in a centrifuge, (iii) dissolving said separated crystals in a tank to produce a sodium carbonate solution, (iv) slaking said sodium carbonate solution with calcium oxide in a slaker to produce a sufficient quantity of NaOH solution suitable for treatment of cellulosic fiber material in said oxygen bleaching zone so that essentially no additional NaOH solution from a make-up source is necessary to continuously effect oxygen bleaching, and (v) separating the resulting NaOH solution in an NaOH clarifier, and

(h) recycling said NaOH solution to said oxygen bleaching zone.

4,131,509

PRESSURE RELIEF DEVICE FOR A NUCLEAR REACTOR CONTAINMENT BUILDING

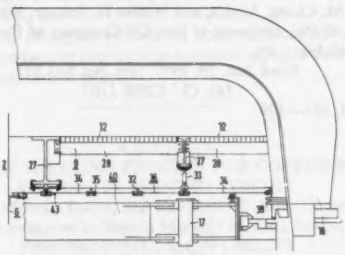
Friedrich Haidlen, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Mar. 24, 1976, Ser. No. 669,920

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1975, 2513822

Int. Cl.² G21C *9/00*

U.S. Cl. 176—38 **7 Claims**



1. In a reactor building having equipment rooms wherein a nuclear reactor, steam generators and circulating pumps are disposed, and having operating rooms separated from the equipment rooms by ceilings and walls largely formed of concrete and provided with relief openings for reducing differential pressures during a reactor accident, the relief openings being formed in a grid-shaped steel girder construction carrying a flat tight skin destructible at a given pressure produced during a reactor accident, the steel girder construction having gratings at the upper side thereof formed with a narrow mesh capable of being walked upon during operation of the reactor, and having said tight skin at the underside thereof in the form of a multiplicity of cassette-shaped membranes suspended therefrom and spaced from the gratings.

4,131,510

MAGNETIC NUCLEAR CORE RESTRAINT AND CONTROL

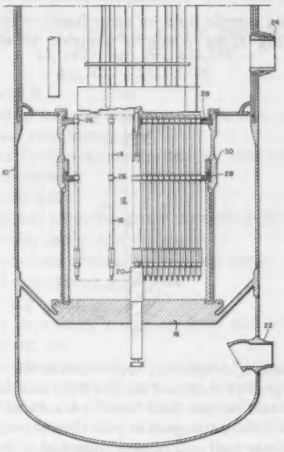
Martin H. Cooper, Monroeville, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,574

Int. Cl.² G21C *7/30*

U.S. Cl. 176—5 **5 Claims**

1. A nuclear reactor comprising a fluid coolant circulated through a core supported within a reactor vessel, said core including a plurality of substantially vertical coextending fuel assemblies, at least some of said assemblies having a compressible structure laterally interposed therebetween in a compressed configuration at selected operating conditions, and means for selectively relieving compression of said structure upon a preselected temperature of said coolant so as to laterally displace portions of said core, said means including electromagnetic restraint structure having a curie temperature with a predetermined relation to said preselected temperature, said restraint structure positionable to laterally compact said core and compress said compressible structure in response to a coolant temperature below said preselected temperature and



inherently positionable to allow lateral expansion of said core and compressible structure in response to a coolant temperature above said preselected temperature.

4,131,511

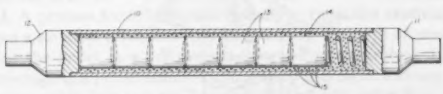
NUCLEAR FUEL ELEMENT

Walter J. Mordarski, Wallingford, Conn., and Jerome Roth, Royersford, Pa., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Feb. 4, 1977, Ser. No. 765,462

Int. Cl.² G21C *3/02*

U.S. Cl. 176—68 **9 Claims**



1. A fuel pin for a nuclear reactor, including,

a casing of zirconium alloy formed into a tube which is closed at each end, a stack of axially aligned nuclear fuel pellets positioned within the casing, and material formed into microspheres which are friable with a controlled crushing strength and which are porous with a controlled density and having substantially no fissionable components positioned in the annulus between the stack of pellets and the internal wall of the casing.

4,131,512

METHOD FOR DETECTING MICROBIAL PATHOGENS EMPLOYING A CUSHIONING AGENT

Gordon L. Dorn, Dallas, Tex., assignor to J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Nov. 5, 1976, Ser. No. 739,274

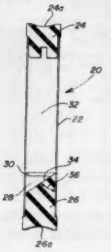
Int. Cl.² C12K *1/04*

U.S. Cl. 195—103.5 M **41 Claims**

1. In a method of detecting the presence of microbial pathogens within a sample fluid suspected of containing microbial pathogens wherein the sample fluid is placed within a confined sterile centrifugation zone and subjected to centrifugation to thereby force said sample fluid against a liquid medium which is nontoxic to the microbial pathogens and has a density greater than the said sample fluid to cause said microbial patho-

gens to be forced from said sample fluid and received by said medium and thereafter separating said liquid medium and said microbial pathogens from said centrifugation zone and analyzing same for said microbial pathogens the improvement comprising:

forcing said sample fluid by centrifugation against a liquid cushioning agent which is nontoxic to said microbial



pathogens, hydrophobic, water immiscible and having a density greater than said sample fluid and thereby able to support said sample fluid but allow substantially none of said microbial pathogens to pass therethrough to thereby cause substantially all of said microbial pathogens to pass from said sample fluid and collect adjacent the interface of said sample fluid and said cushioning agent.

4,131,513

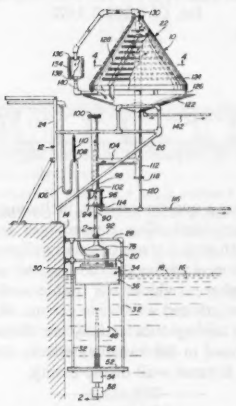
SEAWATER DISTILLATION APPARATUS

Harry S. Green, Rte. 1, Box 253, Wilmington, Ill. 60481

Filed Apr. 13, 1977, Ser. No. 787,302

Int. Cl.[2] B01D *3/02*

U.S. Cl. 202—185 B **3 Claims**



1. An apparatus for purifying liquids, said apparatus including a float member defining a hollow chamber therein extending downwardly below the liquid level on the exterior of said float member, vertically elongated conduit means stationarily supported relative to said float member, including an open lower end projecting downwardly below said liquid level and including an upper portion projecting upwardly into said hollow chamber to a level above said liquid level, said conduit means establishing direct communication between the liquid exteriorly of the float member, below said liquid level, and the interior of said chamber above said level, whereby liquid upon which said apparatus is floated by said float member may rise through said conduit means within the latter to said liquid level below the upper end of said conduit means, heating means in said chamber exteriorly of, spaced about and in good heat transfer relation with the exterior of said upper portion below said liquid level, condenser means for condensing liquid vapors, and conveying means communicating the interior of said conduit means above said level with said condenser means for conveying hot liquid vapors from said chamber into said condenser means for condensing therein, said apparatus including a stationary support, said float member being mounted on said support for vertical shifting therealong in response to increases and decreases in the level of liquid in which said float member is floated relative to said stationary support, said stationary support including an upwardly projecting mount aligned with and disposed below the lower end of said conduit means when said float member is in an upper shifted position relative to said stationary support and projecting upwardly into the lower end of said conduit means when said float member is in a lower shifted position relative to said stationary support, the upper end portion of said mount includes scraper means for scraping accumulated scale and the like from the interior of said conduit means in response to shifting of said float member relative to said stationary support.

4,131,514

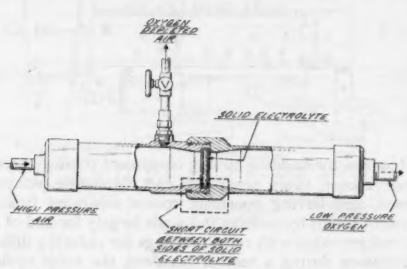
OXYGEN SEPARATION WITH MEMBRANES

Victor M. Chong, Media, and Walter H. Seitzer, West Chester, both of Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jun. 29, 1977, Ser. No. 811,212

Int. Cl.[2] C25B *1/02*

U.S. Cl. 204—129 **6 Claims**



1. A process for separating oxygen from its admixture with other gases which consists of pressuring at a temperature of from about 400° to about 650° C a first side of a solid electrolyte membrane selected from the group of molybdates of bismuth, zinc and silver in which ionic transport of oxygen can occur with said oxygen-containing gas, said membrane being provided with means for electron flow from said first side to the other second side, and separating essentially pure oxygen from the second side of said membrane at a total pressure which is lower than the partial pressure of oxygen on said first side.

4,131,515

METHOD FOR MAKING POSITIVE ELECTRODE FOR LEAD-SULFURIC ACID STORAGE BATTERY

Samuel Ruben, 52 Seacord Rd., New Rochelle, N.Y. 10804

Filed Aug. 26, 1977, Ser. No. 828,882

Int. Cl.[2] H01M *10/44*

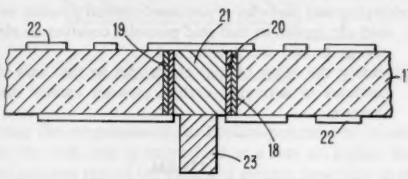
U.S. Cl. 204—2.1 **7 Claims**

1. The process of producing a positive electrode for lead-sulfuric acid electric current producing cells which comprises coating a metal grid having a lead surface with lower oxides of lead selected from the group consisting of Pbo, Pb_2O_3 and Pb_3O_4 cathodically reducing said oxides to lead in situ and thereafter anodically converting said lead in situ to lead peroxide.

4,131,516
METHOD OF MAKING METAL FILLED VIA HOLES IN CERAMIC CIRCUIT BOARDS

Peter Bakos, and John Rasile, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 21, 1977, Ser. No. 817,756
Int. Cl.[2] C25D *5/02, 7/04*
U.S. Cl. 204—15 5 Claims



1. A method of making conductive connections in via holes in printed circuit boards which comprises;

depositing in the via holes a thin film of palladium metal;

depositing a primer coat of a thin film of iron on said palladium film; and

completely filling the primed via holes with copper to provide conductive connections between opposite surfaces of a printed circuit board.

4,131,517
SURFACE TREATING PROCESS FOR COPPER FOIL FOR USE IN PRINTED CIRCUIT

Takahashi Mitsuo, Tokyo, and Kawasumi Yoshio, Urawa, both of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

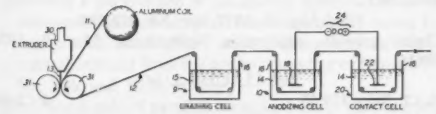
Filed Jun. 3, 1977, Ser. No. 803,275
Int. Cl.[2] C25D *7/06, 5/48, 5/10*
U.S. Cl. 204—27 7 Claims

1. A surface treating process for a copper foil for use in a printed circuit, comprising the step of subjecting a copper foil to a cathodic treatment in an electrolytic bath comprising a sulfuric acid aqueous solution containing nickel and copper ions, with said copper foil being used as a cathode, and thereby forming an electro-deposited layer on the surface of said copper foil, the color of said layer being dark brown, and said layer affording a metallic gloss.

4,131,518
PROCESS FOR ANODIZING ALUMINUM

Howard A. Fromson, 15 Rogues Ridge Rd., Weston, Conn. 06880

Division of Ser. No. 651,018, Jan. 21, 1976, Pat. No. 4,065,364. This application Jul. 19, 1977, Ser. No. 817,463
Int. Cl.[2] C25D *11/04, 11/16*
U.S. Cl. 204—38 A 8 Claims



1. Laminate comprising an aluminum foil bonded on one side to a second member having a smaller area than the aluminum foil, a coating over said bonded side of a polymeric material which is inert to anodizing conditions to encapsulate the second member between the coating and the aluminum foil and an anodically oxidized layer on the other side of the aluminum foil with the encapsulated second member.

4,131,519
CATHODE ELECTROCATALYST

Aleksandrs Martinsons, Wadsworth, and Marilyn Crenshaw, Copley, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 711,759, Aug. 4, 1976. This application Sep. 12, 1977, Ser. No. 832,718
Int. Cl.[2] C25D *5/36*
U.S. Cl. 204—38 B 1 Claim

1. A method of forming an electroconductive surface on a ferrous substrate comprising:

inserting the ferrous substrate into an electroless plating solution comprising

a. a tungsten salt;

b. salts chosen from the group consisting of cobalt salts, nickel salts, and mixtures thereof;

c. a phosphorous containing reducing agent;

d. an acid complexing agent; and

e. a buffering agent;

electrolessly depositing a coating from said solution onto said substrate; and

subsequently electrolytically depositing a coating of at least 3×10^{-5} equivalent of metal per square centimeter of substrate from said solution onto said substrate as a cathode whereby to provide a surface on said ferrous substrate comprising tungsten, phosphorous, and a metal chosen from the group consisting of cobalt, nickel, and mixtures thereof.

4,131,520
TWO-STAGE ANODIZATION OF CAPACITOR ELECTRODES

Walter J. Bernard, Williamstown, and Stanley P. Szpak, Cheshire, both of Mass., assignors to Sprague Electric Company, North Adams, Mass.

Filed Nov. 10, 1977, Ser. No. 850,117
Int. Cl.[2] C25B *11/10;* C25D *11/34*
U.S. Cl. 204—42 10 Claims

1. A process for forming an electrolytic capacitor electrode from a sintered valve-metal pellet including the steps of anodizing the pellet in a conventional formation electrolyte in a first-stage to a predetermined voltage and thereafter forming a thicker oxide layer on the outer surface of said pellet than in the center of said pellet by anodization in a second-stage at a higher voltage, said second-stage anodization being in an electrolyte different from that in the first-stage and containing a salt of a water-soluble weak acid having a dissociation constant of less than 1.0×10^{-4} and then rinsing the pellet free of second-stage electrolyte with water.

4,131,521
ELECTROCHEMICAL SYNTHESIS OF ORGANIC CARBONATES

Divna Cipris, and Irving L. Mador, both of Morristown, N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 7, 1977, Ser. No. 848,976
Int. Cl.[2] C25B *3/02*
U.S. Cl. 204—59 R 18 Claims

1. A process for preparing non-polymeric organic carbonates comprising passing a direct electric current between an anode and cathode immersed in a liquid medium consisting essentially of a non-fluoride halide-containing electrolyte, carbon monoxide and a paraffinic monohydric or 1,2-dihydric alcohol, or mixture thereof, at a temperature below the boiling point of the liquid medium, and under an atmosphere consisting essentially of carbon monoxide.

4,131,522
PROCESS FOR ELECTROLYTICALLY PRODUCING MAGNESIUM AND CHLORINE FROM FUSED SALT BATH

Konstantin D. Muzhzhavlev, ulitsa Zheleznovodskaya, 48, kv. 30, Leningrad; Vladimir D. Yazev, ulitsa Jubileinaya, 64-56, Berezniki Permskoi oblasti; Vladimir I. Schegolev, ulitsa Korablestroitelei, 29, korpus 4, kv. 252; Andrei B. Ivanov, prospekt Smirnova, 59, kv. 151, both of Leningrad; Alexei V. Vasiliev, ulitsa Bogdana Khmelnitskogo, 66, kv. 57; Oleg N. Romanenko, ulitsa Sevastopolskaya, 6, kv. 46, both of Kalush Ivano-Frankovskoi oblasti; Sergei P. Kosarev, Nalichnaya ulitsa, 39-1, kv. 20, Leningrad, and Vladimir G. Ovcharenko, ulitsa Bogdana Khmelnitskogo, 17, kv. 45, Kalush Ivano-Frankovskoi oblasti, all of U.S.S.R.

Filed Sep. 29, 1977, Ser. No. 837,857

Int. Cl.² C25B *1/00*; C25C *3/04*

U.S. Cl. 204—60 **6 Claims**

1. A process for producing magnesium and chlorine in an electrolytic cell from a mixture of anhydrous magnesium, potassium and sodium chlorides, wherein the molar ratio of potassium chloride to magnesium chloride ranges from 0.9 to 5.0, comprising the following steps:

preparing an electrolyte in the electrolytic cell, comprising magnesium, potassium and sodium chlorides, wherein the molar ratio of potassium chloride to sodium chloride ranges from 1.2 to 2.7 and the content of sodium chloride in the melt ranges from 19 to 38% by weight;

maintaining the electrolyte temperature within the range of from 670° to 690° C.;

passing direct current through the electrolyte so as to recover magnesium and chlorine;

removing magnesium regularly from the electrolyte surface and withdrawing chlorine continuously from above the electrolytic cell bath; and

replenishing the electrolyte with a mixture of chlorides comprising, by weight, 38 to 48% $MgCl_2$, 35 to 43% KCl, 12 to 24% NaCl, and 0.2 to 0.5% MgO and impurities of not more than 1%, as magnesium and chlorine are removed from the electrolytic cell.

4,131,523
METHOD OF ELECTROCHEMICALLY PROCESSING METALLIC SURFACES

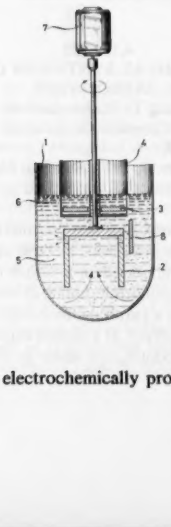
Wolfgang Faul, Julich, and Bertel Kastening, Hamburg, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Julich, Fed. Rep. of Germany

Filed Dec. 5, 1977, Ser. No. 857,570

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1976, 2655137

Int. Cl.² C25F *3/02, 3/14*

U.S. Cl. 204—129.1 **5 Claims**



1. A method of electrochemically processing metallic surfaces of workpieces with an electrolysis cell having two electrodes, which includes in combination the steps of:

adding an electrolyte to said electrolysis cell;

adding to and suspending in said electrolyte specially treated particles of activated carbon powder heated at a temperature above 700° C in an inert atmosphere and providing a high storage capacity for electrical charges;

bringing said workpiece into contact with said electrolyte in such a way that said workpiece does not contact said electrodes;

charging said particles of activated carbon powder on one of said electrodes so that said particles conduct an electrical charge to said workpiece; and

shielding the other of said electrodes so that said charged particles of activated carbon powder cannot discharge thereon.

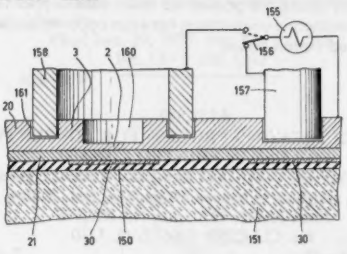
4,131,524
MANUFACTURE OF SEMICONDUCTOR DEVICES

Antonous C. M. Gieles, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 879,171, Nov. 24, 1969, abandoned. This application Jul. 29, 1971, Ser. No. 167,504

Int. Cl.² C25F *3/12*

U.S. Cl. 204—129.3 **1 Claim**



1. A method of manufacturing a semiconductor device comprising the steps of providing a plate-shaped semiconductor body of one conductivity type, forming a substantially continuous layer of semiconductor material of opposite conductivity type on a flat side of said body, forming at least one circuit element in said layer, providing electrical contacts to said circuit element, removing by spark erosion a first portion of the semiconductor body opposite said layer and short of said layer and then using a selective etching process to remove a second portion of the semiconductor body down to said layer.

4,131,525
METHOD OF MANUFACTURING A BODY HAVING A GOLD PATTERN AND BODY MANUFACTURED ACCORDING TO THE METHOD

Rudolf P. Tijburg, and Teunis van Dongen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,480

Claims priority, application Netherlands, Mar. 9, 1976, 7609816

Int. Cl.² C25F *3/14*

U.S. Cl. 204—129.65 **3 Claims**

1. A method of manufacturing a semiconductor body having a patterned gold layer, which comprises the steps of:

providing a semiconductor body;

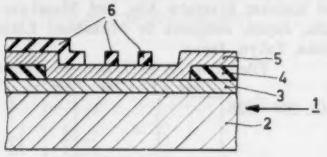
providing a gold layer on a surface of said semiconductor body;

locally providing an etchant-resistant and electrically insulating patterned masking layer on the surface of said gold layer;

subjecting the masked gold layer to a chemical etching

treatment at a selected rate in an etching bath to form the patterned gold layer;

applying a potential to said gold layer with respect to an electrode in the etching bath during the etching treatment; and



selecting the magnitude of the applied potential to be such that the etch rate is maintained at a rate no higher than said selected rate of the chemical etching treatment in the absence of an applied voltage.

4,131,526

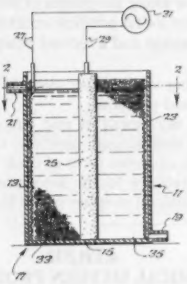
PROCESS AND APPARATUS FOR REMOVAL OF CONTAMINANTS FROM WATER

Karl Moeglich, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 573,577, Apr. 30, 1975, abandoned. This application Sep. 21, 1977, Ser. No. 835,377

Int. Cl.[2] C02B *1/82;* **C25B** *3/02*

U.S. Cl. 204—149 **20 Claims**



1. A process for the removal of oxidizable contaminants from an aqueous medium comprising:

providing a container;

providing a packed bed of particulate material within said container, each of said particles comprising a carrier having an oxide coating, said coating comprising an oxide of a metal selected from the group consisting of Groups IVa, Va, VIb, and VIIb, metals;

providing a pair of parallel, elongated electrodes extending substantially through said bed coupled to a source of alternating current having a frequency of 0.5 to 800 Hz; and

directing said aqueous medium into said container and through said bed in a direction parallel to the longitudinal axis of said electrodes while said current is applied across said electrodes to oxidize at least a portion of the contaminants therein.

4,131,527

METHOD FOR SELECTIVELY REDUCING PLUTONIUM VALUES BY A PHOTOCHEMICAL PROCESS

Horace A. Friedman; Louis M. Toth, both of Oak Ridge, and Jimmy T. Bell, Kingston, all of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 30, 1977, Ser. No. 782,873

Int. Cl.[2] C01G *56/00;* **B01J** *1/10*

U.S. Cl. 204—157.1 R **12 Claims**

1. A method for enhancing the rate of reduction of Pu(IV) to Pu(III) in an aqueous nitric acid solution having dissolved therein hydrazine, Pu(IV) values, and U(VI) values, said method comprising exposing said solution to a source of 200–500 nm electromagnetic radiation of sufficient intensity to cause Pu(IV) and U(VI) values in said solution to absorb at least 100 watts per mole per hour of Pu(IV) reduced.

4,131,528

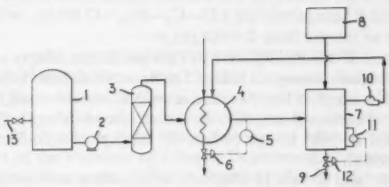
PROCESS FOR THE MASS PRODUCTION OF OZONE

Minoru Tsujimoto, Fujiiderashi; Minoru Okada, Ikedashi; Yuji Suzuki, Takatsukishi, and Toshihiro Hirai, Nishino Sakaishi, all of Japan, assignors to Daido Sanso Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1976, Ser. No. 754,029

Int. Cl.[2] B01J *1/10;* **C01B** *13/11*

U.S. Cl. 204—157.1 R **8 Claims**



1. 7. A process for the mass production of ozone, comprising warming a liquid oxygen to a temperature not higher than the boiling point of ozone by means of a heat exchanger, thereby obtaining a gasified oxygen; introducing said gasified oxygen to a reaction chamber; impinging ozoning radiations selected from the group consisting of laser beams, and plasma discharges upon said gasified oxygen, hereby generating ozone; and collecting said ozone in its liquid state separated from said gaseous oxygen under said thermal atmosphere having a temperature not higher than the boiling point of ozone and wherein unreacted oxygen is recycled to the heat exchanger for reuse in the process.

4,131,529

PHOTOINITIATORS FOR PHOTOPOLYMERIZABLE COATING COMPOSITIONS

Rolf Osterloh, Ludwigshafen; Manfred Jacobi, Frankenthal, and Werner Kuesters, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

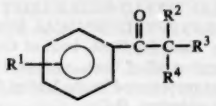
Filed May 13, 1977, Ser. No. 796,546

Int. Cl.[2] C08F *2/46, 4/00*

U.S. Cl. 204—159.14 **12 Claims**

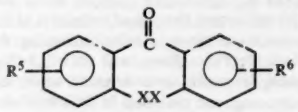
1. A photopolymerizable coating composition which contains, as the binder, an olefinically unsaturated compound of boiling point above 50° C., together with from 0.5 to 15 percent by weight of a photoinitiator, based on the binder, the photoinitiator comprising a mixture of:

(A) an aromatic carbonyl compound of the formula



(I),

(B) an aromatic carbonyl compound of the formula



(II)

and (C) an amine of the formula

(III)

wherein in formulae I, II and III,

R^1 is H, Cl, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or alkoxyalkyl of 2 to 4 carbon atoms, R^2 is H, Cl or R^1-phenyl, and if (a) R^2 is H or Cl, R^3 and R^4 are H, Cl, alkyl of 1 to 4 carbon atoms or R^1-phenyl, while (b) if R^2 is R^1-phenyl, R^3 is alkoxy of 1 to 7 carbon atoms and R^4 is R^3, H, alkyl of 1 to 4 carbon atoms or CH_2OH, or R^3 and R^4 conjointly are a $O—C_n—H_{2n}—O$ bridge, where n is an integer from 2 to 8,

R^5 and R^6 are H, alkyl of 1 to 5 carbon atoms, alkoxy of 2 to 5 carbon atoms, COOH, $COOR^7$ or $COON(R^7)_2$ (where R^7 is alkyl of 1 to 7 carbon atoms), Cl or chloroalkyl of 1 to 3 carbon atoms, X is H, a direct bond or an O, CO, S, NH or NR^8 bridge (where R^8 is alkyl of 1 to 5 carbon atoms), and

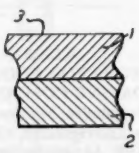
R′, R″ and R‴ are H, alkyl of 1 to 10 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, aryl, hydroxyalkyl of 1 to 8 carbon atoms or alkoxyalkyl of 2 to 4 carbon atoms, with the proviso that at most 2 substituents are H and at most 2 substituents are aromatic.

4,131,530

SPUTTERED CHROMIUM-ALLOY COATING FOR PLASTIC

Peter Blum, North Plainfield, N.J., and Richard A. Lucariello, Walnut Creek, Calif., assignors to Airco, Inc., Montvale, N.J.

Filed Jul. 5, 1977, Ser. No. 812,962
Int. Cl.² C23C *15/00*; B32B *15/04*
U.S. Cl. 204—192 C **18 Claims**



1. An article comprising a plastic base and a crack-resistant metal coating deposited by sputtering a target consisting essentially of 5 to 30% by weight iron, 0 to 5% by weight of scavenger elements, balance chromium.

10. A method of depositing a crack-resistant metal coating onto a plastic substrate comprising:

placing the substrate in a chamber containing a sputtering gas; and

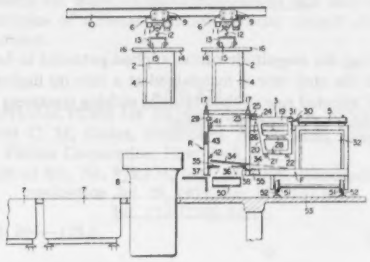
sputtering a target consisting essentially of 5 to 30% by weight iron, 0 to 5% by weight of scavenger elements, balance chromium to deposit a coating on the substrate.

4,131,531

APPARATUS FOR STRIPPING ELECTRODEPOSITED METAL FROM CATHODE SHEETS

Koichi Kaneko; Kiyotaka Abe, and Masakazu Miura, all of Akita, Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 29, 1977, Ser. No. 811,447
Int. Cl.² C25C *7/08*
U.S. Cl. 204—208 **17 Claims**



1. Apparatus for stripping from cathode sheets high-purity metal layers deposited on the opposite faces of the sheets by electrolysis, comprising:

rack means for holding therein the cathode sheets with said metal layers deposited thereon in side-by-side relationship with predetermined spacings therebetween, said rack means having at least one open side;

a plurality of stripper assemblies each comprising a pair of stripper plates disposed in face-to-face arrangement with respect to each other and substantially in coplanar relationship to a respective one of the cathode sheets held in positions within said rack means, said stripper assemblies being movable along the planes of the respective cathode sheets between a first position confronting said open side of said rack means and a second position within said rack means; and

means for moving said stripper assemblies between said first and said second positions,

whereby upon movement of said stripper assemblies from said first to said second position, the metal layers are peeled off the opposite faces of each cathode sheet as the latter slides relative to the associated stripper assembly between the pair of stripper plates thereof.

4,131,532

ELECTROCHEMICAL OXYGEN PRODUCTION DEVICE

Nicole Chillier-Duchatel, Sevres, and Bernard Verger, Chevreuse, both of France, assignors to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie", Paris, France

Division of Ser. No. 731,696, Oct. 12, 1976. This application Oct. 3, 1977, Ser. No. 838,959
Claims priority, application France, Oct. 29, 1975, 75 33082
Int. Cl.² C25B *9/00*
U.S. Cl. 204—256 **4 Claims**

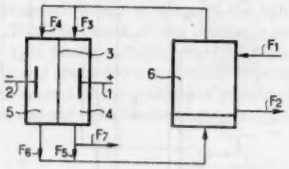
1. Apparatus for producing oxygen at an anode comprising

an oxidation reactor chamber where air oxidizes the reduced form of a compound to form a peroxide capable of spontaneously decomposing into a mixture of water and into the oxidized form of said compound;

an electrolyzer having an anode and a cathode separated by a semi-permeable membrane defining an anodic compartment and a cathodic compartment, each of which is disposed to receive a portion of said mixture leaving said reactor chamber, said anodic compartment being adapted

to electrochemically oxidize the water so that oxygen is liberated, said cathodic compartment being adapted to electrochemically reduce said oxidized form of the compound so that said reduced form is regenerated;

means connecting said reactor to said anodic compartment and to said cathodic compartment for receiving a portion of said mixture from said reactor chamber;



second means connecting said anodic compartment and said cathodic compartment for recycling the respective products of each of said compartments to said reactor chamber; and

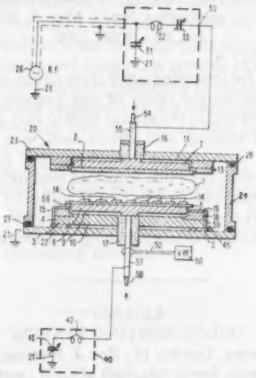
means for recovering oxygen from said anodic compartment.

4,131,533

RF SPUTTERING APPARATUS HAVING FLOATING ANODE SHIELD

Joseph A. Bialko, and John S. Lechaton, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,812
Int. Cl.² C23C *15/00*
U.S. Cl. 204—298 **16 Claims**



1. In apparatus for the radio frequency sputtering of target material onto substrates including:

a low-pressure ionization chamber connected to a reference potential,

a source of radio frequency power for producing a plasma across a target electrode and a substrate electrode in said chamber,

impedance means electrically connected directly between said substrate electrode and said reference potential,

further including a substrate electrode shield partially enclosing said substrate electrode for protecting said substrate electrode from unwanted sputtering,

the improvement wherein:

said shield is insulated from said reference potential.

4,131,534

PREPARATION OF CARRIER AMPHOLYTE MIXTURES

Wilhelm Just, Frankfurt am Main, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V., Munich, Fed. Rep. of Germany

Filed Dec. 14, 1977, Ser. No. 860,615
Claims priority, application Fed. Rep. of Germany, Dec. 15, 1976, 2656801
Int. Cl.² G01N *27/26*
U.S. Cl. 204—299 R **19 Claims**

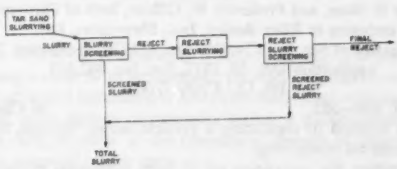
1. A process for the synthesis of a carrier ampholyte mixture which comprises first reacting at least one organic compound substituted with at least two amino or imino groups and at least one unsaturated carboxylic acid ester containing an activated double bond in an anhydrous organic solvent at a temperature of from about 0° C to 50° C to produce a mixture of amino-carboxylic acid esters and thereafter hydrolyzing the esters to produce a mixture of amino-carboxylic acids; the carboxylic acid moiety of the unsaturated carboxylic acid ester being aliphatic and containing up to 12 carbon atoms; the ester moiety being aliphatic and containing up to 6 carbon atoms.

4,131,535

TREATMENT OF TUMBLER REJECT

Kenneth Porteous, Edmonton, Canada, assignor to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity, Edmonton, Canada; Ontario Energy Corporation, Toronto, Canada; Imperial Oil Limited, Toronto, Canada; Canada-Cities Service, Ltd., Calgary, Canada and Gulf Oil Canada Limited, Toronto, Canada

Filed Feb. 14, 1977, Ser. No. 768,358
Int. Cl.² C10G *1/04*
U.S. Cl. 208—11 LE **1 Claim**



1. A process for producing a flooded slurry of tar sand containing bitumen which comprises:

mixing tar sand with hot water in a rotating conditioning vessel to produce a first slurry containing rocks and lumps of tar sand;

screening the first slurry to remove a reject portion mainly comprising said rocks and lumps, both associated with bitumen;

mixing said reject portion with hot water in another rotating conditioning vessel to disperse associated bitumen and produce a second slurry containing rocks and some remaining lumps of tar sand; and

screening rocks and lumps from said second slurry and combining the screened second slurry with the screened first slurry to form a flooded slurry capable of being pumped to a separation vessel.

4,131,536
HYDROCARBON CONVERSION WITH A SELECTIVELY SULFIDED ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Frank H. Adams, La Grange Park, and H. Peter G. Knapik, Brookfield, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 804,136, Jun. 6, 1977. This application Nov. 25, 1977, Ser. No. 855,097
Int. Cl.[2] C10G *35/08*
U.S. Cl. 208—139 **19 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon in a reaction zone maintained at hydrocarbon conversion conditions with a selectively sulfided acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % nickel, about 0.01 to about 5 wt. % tin and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and tin are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the tin is present in the form of tin oxide; and wherein substantially all of the catalytically available nickel is present in a sulfided state.

4,131,537
NAPHTHA HYDROFINING PROCESS

William E. Winter, Baton Rouge, La., and Mamerto G. Luzarraga, Summit, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 4, 1977, Ser. No. 839,161
Int. Cl.[2] C10G *23/02*; B01J *23/88*
U.S. Cl. 208—216 **19 Claims**

1. A process fior hydrofining an olefinic naphtha hydrocarbon feed which comprises contacting said feed in vapor phase, and hydrogen, with a fixed bed of particulate catalyst comprised of a composite of a Group VIB or Group VIII metal, or both, and an inorganic oxide support, of average size below about 1/20 inch diameter at pressure ranging from about 60 psig to about 300 psig.

4,131,538
METHOD OF SEPARATING A PREDETERMINED FRACTION FROM PETROLEUM OIL USING MULTISTAGE EVAPORATORS

Charles D. Rose, and Frederick W. Gilbert, both of Shreveport, La., assignors to Riley-Beaird, Inc., Shreveport, La.

Continuation of Ser. No. 674,223, Apr. 6, 1976, abandoned. This application Oct. 20, 1977, Ser. No. 843,831
Int. Cl.[2] C10G *7/00*
U.S. Cl. 208—352 **26 Claims**

1. A method of separating a predetermined fraction from petroleum oil comprising:

preheating the petroleum oil to form preheated petroeum oil;

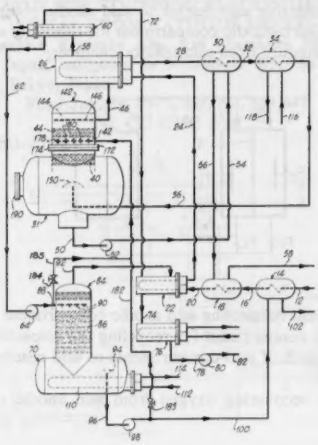
vaporizing a portion of the preheated petroleum oil to form a first vapor fraction and a first residual liquid;

separating the first vapor from the first residual liquid in a means for separating gas from liquid and removing the first residual liquid such that said first residual liquid does not form part of said predetermined fraction;

condensing at least a portion of said first vapor fraction to form a first condensate;

feeding a petroleum fraction consisting essentially of said first condensate as essentially a sole feed stock into an evaporator, said evaporator being at a temperature of operation above the temperature of condensation of said first vapor fraction; vaporizing at least a portion of said first condensate in said evaporator to form a second vapor fraction and a predetermined liquid fraction;

inimmately contacting said first condensate with said second vapor fraction while transferring a portion of said second vapor fraction to said first condensate and transferring a portion of said first condensate to said second vapor fraction;



removing said second vapor fraction from said evaporator after mass transfer of said second vapor fraction with said first condensate; and

collecting said predetermined liquid fraction.

4,131,539
REMOVING RUTILE FROM ZIRCON ELECTROSTATICALLY

Kozo Ojiri, Kamakura, and Kohzo Sakai, Tokyo, both of Japan, assignors to Asahi Glass Company Limited, Tokyo, Japan

Filed Feb. 25, 1977, Ser. No. 772,141
Claims priority, application Japan, Mar. 5, 1976, 51/23140
Int. Cl.[2] B03C *7/00*
U.S. Cl. 209—127 A **6 Claims**

1. A method for removing rutile from zircon sand containing titanium dioxide on the order of one percent, said titanium dioxide being present in the sand at least in part as rutile, which comprises heat treating said zircon sand in a non-oxidizing atmosphere so as to change the electrostatic property of the rutile and removing the rutile from said heat treated sand by an electrostatic separation in an amount sufficient to reduce the titanium dioxide content of the sand to not more than about 0.1 wt.% TiO_2, said heat treatment being at a temperature greater than 400° C.

4,131,540
COLOR SORTING SYSTEM

Robert G. Husome, Jerome, Id.; Ron J. Fleming, San Jose, and Ron E. Swanson, Sunnyvale, both of Calif., assignors to Johnson Farm Machinery Co. Inc., Woodland and Acurex Corporation, Mountain View, both of, Calif.

Filed May 4, 1977, Ser. No. 793,679
Int. Cl.[2] B07C *5/344*
U.S. Cl. 209—582 **5 Claims**

1. Tomato sorting apparatus comprising in combination:

(a) means for serially moving tomatoes in a row past an inspection station along a predetermined path;

(b) illumination means at the inspection station for illuminating the passing tomatoes;

(c) a translucent, light diffusing plate positioned at the inspection station, and having a viewing side facing away from the tomatoes at the inspection station;

(d) a lens disposed between tomatoes passing the inspection station and the plate for forming on the viewing side of the plate a focused image of each tomato passing the station;

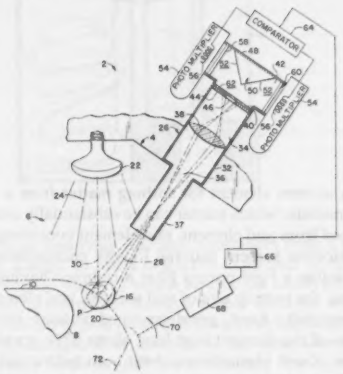
whereby diffused light generated by image radiates away from the viewing side;

(e) field stop means defining a light aperture disposed between the lens and the plate for limiting the size of the image formed on the plate so that images of tomatoes of substantially the smallest acceptable diameter substantially fully cover the aperture;

(f) a beam splitter positioned to receive the diffused light directing diffused light beams in different directions;

(g) filter means positioned to intercept the light beams and remove from the beams all but relatively narrow green and red light bands including light of a wavelength of about 550 and about 640 nanometers, respectively;

(h) first and second photo-multipliers positioned to receive the green and red light bands for generating a green light



signal and a red light signal, respectively, as a function of green light and red light, respectively, present in the image of the tomatoes projected onto the viewing side;

(i) means for forming a reject signal from the signals of the photo-multipliers when the magnitude of the green signal has a predetermined magnitude relative to the red signal;

(j) a reciprocating member positioned to contact tomatoes to be removed and responsive to the reject signal for removing such tomatoes from the tomato flow past the inspection station; and

(k) an elongated light tube having a length exceeding its width disposed between the lens and tomatoes passing the inspection station for preventing fluids from tomatoes being removed by the reciprocating member from the flow from contacting the lens.

4,131,541

REMOVING COAGULABLE SUBSTANCES FROM AN AQUEOUS MEDIUM

Warner J. de Putter, Hardenberg, Netherlands, assignor to Wafilin B.V., Zwolle, Netherlands

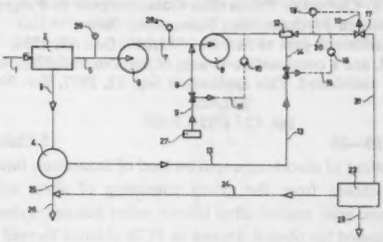
Filed Jul. 30, 1975, Ser. No. 600,427

Claims priority, application Netherlands, Jul. 31, 1974, 7410323

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—23 F **2 Claims**

1. A process for removing quantities of heat coagulable substances from an aqueous medium containing waste fruit water produced in processing potatoes the coagulation of which is effected by rapidly heating to a temperature of at least 80° C. and preferably ranging from 100° to 120° C., subjecting the aqueous medium to an ultrafiltration effected with membranes having a flux of more than 3 cm3/cm2/h and preferably 4cm3/cm2/h with a pressure ranging from 5–15 atmospheres



prior to heating to increase portein concentration to a value of at least 4%.

4,131,542

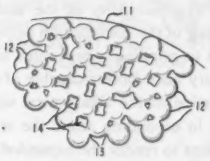
SPRAY DRIED SILICA FOR CHROMATOGRAPHY

Horacio E. Bergna, and Joseph J. Kirkland, both of Wilmington, Del., assignors to E. I. DuPont de Nemours and Company, Wilmington, Del.

Filed Jul. 19, 1977, Ser. No. 817,060

Int. Cl.[2] B01D *15/08*

U.S. Cl. 210—31 C **11 Claims**



10. A process of separating by chromatography comprising passing a material to be separated through a separation column packed with a hereinbelow described class of amorphous spheroidal silica porous micrograins having a packed density of from 30% to 40% of the theoretical density of amorphous silica prepared by the steps of:

(a) spray drying with flowing air at a temperature of from 130° C. to 400° C. a silica sol containing from 5 to 60 weight percent essentially non-aggregated amorphous spherical silica particles of uniform size wherein at least 75% of the particles have a diameter of from 0.5D to 2D where D is the weight average diameter and D is from 5 to 80 nanometers to form porous micrograins from 3 to 100 micrometers in diameter, containing at least 55 volume percent silica,

(b) sintering the porous micrograins to reduce the surface area thereof from 5% to 20%, and

(c) classifying the porous micrograins so that at least 90% of the porous micrograins in a class have a diameter in the range of 0.5 to 1.5X where X is the weight average diameter of the porous micrograins in a class and X is from 3 to 100 micrometers and separating the material into components.

4,131,543
METHOD OF ABSORBING LIQUIDS USING A PREPARATION OF EXPANDED SILICATE-BASED AGGREGATES

Theodore F. Carosello, Painesville, Ohio, assignor to Progressive Research Products, Inc., Painesville, Ohio

Continuation-in-part of Ser. No. 751,260, Dec. 17, 1976, abandoned, and a continuation-in-part of Ser. No. 796,970, May 16, 1977, abandoned. This application Sep. 12, 1977, Ser. No. 832,422

Int. Cl.[2] C02B *9/02*

U.S. Cl. 210—36 **5 Claims**

1. A method of absorbing a spill on land of hazardous, liquid materials chosen from the group consisting of nitric acid, hydrochloric acid, methyl ethyl ketone, other ketones, xylene, polychlorinated bis phenol, known as PCB, slurries thereof in gel form, crude petroleum oils, bunker fuel oil, gasoline, fuel oils, common solvents, and similar hazardous materials, consisting of taking an expanded insoluble light weight aggregate material formed by:

(A) mixing, at a temperature less than boiling, an aqueous alkali metal silicate having an alkali metal oxide: silicon dioxide weight ratio of from about 1:3.0–7.0 with an essentially anhydrous alkali metal silicate within the same weight ratio range, the amount of anhydrous added being that quantity sufficient to give, in combination with the aqueous, a total alkali metal silicate solids content of from 80–40% by weight and the amount of alkali metal silicate solids being 40–90% by weight, dry basis, of the total resultant aggregate;

(B) admixing, prior to the time when the anhydrous alkali metal silicate becomes substantially hydrated, two insolubilizing compounds as follows:

(1) a primary insolubilizer capable of reacting with the alkali portion of the alkali metal silicate at temperatures less than boiling, the amount used being that sufficient to reduce hygroscopicity of the silicate to the point where caking of the composition prior to expansion but subsequent to grinding is prevented and

(2) a secondary insolubilizer capable of reacting with the silicate portion of the alkali metal silicate at temperatures used in expanding same, the amount used being that sufficient to render the expanded aggregate water-insoluble, the total amount of insolubilizers used being less than the stoichiometric amount required for total reaction with the alkali metal silicate present;

(C) continuing mixing until the components will not separate on standing at temperatures up to boiling;

(D) curing the mixed composition at temperatures up to boiling until the anhydrous alkali metal silicate has become substantially hydrated and the primary insolubilizer reacted;

(E) cooling the composition to a grindable solid;

(F) grinding the composition into discrete nonadherent particles suitable for expansion and

(G) rapidly expanding the particles and causing the secondary solubilizer to react by exposure to temperatures of from about 900°–1800° F., to provide an insoluble light weight aggregate which is free flowing in small clusters, having an average density in loose bulk of 2.5 to 3.5 pounds per cubic foot, and having a water absorption of 1.5 gallons per cubic foot, said insoluble light weight aggregate being sized at substantially 10 meshes per inch, then spread this light weight aggregate material over said spill thick enough to absorb said hazardous material.

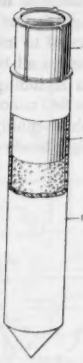
4,131,544
MACROENCAPSULATED SORBENT ELEMENT AND PROCESS FOR USING THE SAME

Nasik Elahi, 41-77 Frame Pl., Flushing, N.Y. 11355

Filed Aug. 3, 1976, Ser. No. 711,293

Int. Cl.[2] B01D *15/00, 53/02*

U.S. Cl. 210—40 **14 Claims**



1. A sorbent element for sorbing matter from a gaseous or liquid medium which matter can be substantially quantitatively desorbed from said element, said element consisting essentially of particulate sorbent material loosely encapsulated and confined within a rigid porous filter membrane having pore sizes less than the particle size of said sorbent, said element being of a substantially fixed, pre-determined volume such that the volume of the element is at least about 25% greater than the volume of said particulate sorbent both before and after sorption of matter by said sorbent, whereby said particulate sorbent agitates freely within said element both before and after its sorption of matter to facilitate the sorption and subsequent desorption of matter therefrom.

4,131,545
WATER TREATMENT

William H. Redmayne, Widnes, and David Berry, Hyde, both of England, assignors to Laporte Industries Limited, London, England

Continuation of Ser. No. 668,832, Mar. 22, 1976, abandoned. This application May 2, 1977, Ser. No. 792,573

Claims priority, application United Kingdom, Apr. 5, 1975, 14038/75

Int. Cl.[2] C02B *1/20*

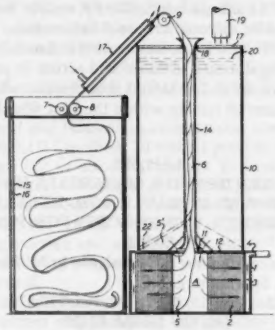
U.S. Cl. 210—47 **8 Claims**

1. A process for the production of solutions of phosphate-containing basic aluminum compounds, comprising the steps of refluxing aluminum sulphate solution with phosphoric acid at elevated temperature above 50° C. to 90° C., introducing chloride by the addition of hydrochloric acid or calcium chloride, basifying by the addition of calcium oxide, hydroxide or carbonate in order to effect preferential precipitation of calcium sulphate and in an amount sufficient to produce a basicity of from 33 to 80% said phosphoric acid and said calcium compounds being introduced in such amounts that the molar ratio of phosphate and sulphate aluminum in said basic aluminum compounds falls within the range of from 0.05:1 to 0.30:1 and thereafter causing or permitting the solution to cool quickly to below 60° C.

4,131,546
METHOD AND APPARATUS FOR REMOVING FILTERABLE SUBSTANCES FROM A LIQUID

Knut Å. G. Olsson, Lund; Karl P. E. Åström, Staffanstorp, and Johan C. Johansson, Lund, all of Sweden, assignors to Ifo Sanitar AB, Bromolla, Sweden

Filed May 20, 1977, Ser. No. 799,038
Claims priority, application Sweden, May 24, 1976, 7605850
Int. Cl.[2] B01D *33/00*
U.S. Cl. 210—77 12 Claims



1. Method for removing filterable substances from a liquid, for example, sludge, or fibers in slurries in a liquid or oil in an emulsion of oil and water, in which method the liquid is continuously or intermittently led through a fiber material, wherein the liquid is caused to pass radially through a cylindrical roll of web-like, wet-strength fiber material at the same time as the fiber web which forms the roll is continuously drawn out at a sufficiently low speed from the roll in a spiral tube which retains said substances therewithin, while continuously renewing the filtration surface of said roll.

11. Apparatus for filtering a liquid, comprising a chamber with a roll mounted in the chamber, the roll consisting of a web of wet-strength fiber material with filtering properties and having a central cavity means which is defined by the innermost fiber web turn of the roll, means for conducting liquid to be filtered to the one circumferential side of the roll, means for conveying off liquid from the vessel at the other circumferential side of the roll, means for guided withdrawal of the fiber web from said one circumferential side of the roll to form a filter which retains filterable web spiral tube means substances removed from said liquid therewithin, and means for collecting the fiber web withdrawn from the roll.

4,131,547
REFILLABLE COLUMN FOR CHROMATOGRAPHY AT ELEVATED PRESSURE

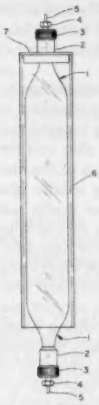
Karl H. Michel, Indianapolis, and Robert F. Miller, Danville, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 2, 1977, Ser. No. 847,872
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—198 C 8 Claims

1. A refillable column for chromatography at elevated pressure comprised of:

(a) a cylinder having a first and a second end with a length exceeding the diameter by a factor of 2 or more, said cylinder being connected at each end to a coupling having internal threads of an inside diameter greater than the inside diameter of said cylinder at the point of connection between said coupling and said cylinder and an annular shoulder disposed at the internal terminus of said thread;

(b) a resilient plug having external threads adapted to mate with said internal threads of said coupling disposed therein, said plug having an inwardly tapered extension depending from said threads adapted to contact and cooperate with the annular shoulder of said coupling forming a seal therewith, said extension also having an inwardly and upwardly tapered bottom, said plug also having an axial bore with internal threads disposed in the end opposite said extension and an axially disposed hole communicating between the bottom of said bore and the bottom of said extension of said plug; and

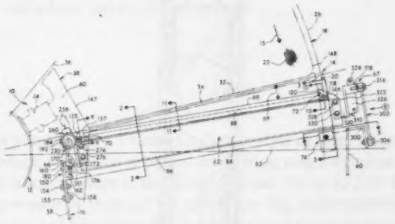


(c) a bushing having external threads adapted to engage the internal threads of said bore and disposed therein, said bushing also having an axial hole communicating between the top thereof and the axial hole in said plug with a tubular extension from the top of said hole adapted to receive a flexible tube connection therewith.

4,131,548
ROTARY DISC FILTER SCRAPER APPARATUS

C. Lynn Peterson, Salt Lake City, Utah, assignor to Peterson Filters Corporation, Salt Lake City, Utah

Filed Oct. 31, 1977, Ser. No. 847,071
Int. Cl.[2] B01D *33/36*
U.S. Cl. 210—331 31 Claims



1. In a rotary disc filter machine comprising a rotatable center shaft means continuously rotatable in one direction and a plurality of axially spaced filter disc units mounted on and rotatable with the center shaft means, each filter disc unit comprising a plurality of filter disc segments having radially and circumferentially extending axially spaced oppositely facing parallel filter media side surfaces on which filter cake is deposited and radially innermost and radially outermost circumferentially extending axially spaced oppositely facing parallel support surfaces circumjacent the filter media side surfaces; the invention of scraper blade apparatus sequentially associated with each filter media side surface of each filter disc segment of each filter disc unit comprising:

main scraper blade means mounted in axially spaced juxtaposition to and extending generally radially across an associated filter disc unit for sequentially removing filter cake

from the axially adjacent filter media side surfaces of each filter disc segment during each revolution of the associated filter disc unit;

a radially innermost main scraper blade mounting bracket means being mounted in fixed axial relationship to and being located radially inwardly adjacent the associated filter disc unit for supporting the radially innermost end portion of the main scraper blade means in sequential uniform closely axially spaced juxtaposition to the axially adjacent filter media side surface of each of the filter disc segments of the filter disc unit during each revolution of the filter disc unit;

a second radially outermost main scraper blade mounting bracket means being mounted in fixed axial relationship relative to and being located radially outwardly adjacent the associated filter disc unit for supporting the radially outermost end portion of the main scraper blade means in sequential uniformly axially spaced juxtaposition to the axially adjacent filter media side surface of each of the filter disc segments of the filter disc unit during each revolution of the filter disc unit; and

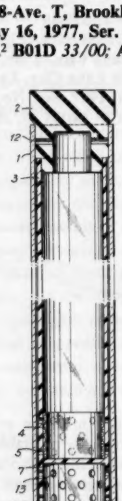
cake scraping and blade supporting shoe means mounted on the radially innermost and the radially outermost end portions of the main scraper blade means for continuous sequential sliding abutting engagement with the radially innermost and radially outermost circumferentially extending supporting surfaces of each filter disc segment of the associated filter disc unit to locate said main scraper blade means in predetermined axially spaced relationship to the adjacent filter media side surface and for removing filter cake from the support surfaces to maintain the predetermined axial spacing of said main scraper blade means relative to the adjacent filter media side surface.

4,131,549

SERUM SEPARATION DEVICE

Louis T. Ferrara, 2988-Ave. T, Brooklyn, N.Y. 11229

Filed May 16, 1977, Ser. No. 797,357
Int. Cl.[2] B01D *33/00;* A61B *5/14*
U.S. Cl. 210—359 **2 Claims**



1. A serum separation device comprising, in combination:

a first elongated tubular vessel closed at the bottom or lower end and open at the top or upper end;

a resilient stopper with air vents being permanently affixed to said top end, said air vents being above the connection between the stopper and the first vessel top end to allow the first vessel interior to be vented;

a filter means being contained within the first vessel lower end and communicating with the exterior of said first vessel through the sidewall thereof, said filter means being of a size so that only serum can pass therethrough;

a second elongated tubular vessel closed at the bottom or lower end and open at the top or upper end and being substantially longer in length and larger in diameter than said first vessel; and,

said first vessel being telescopingly receivable by said second vessel so that a space is formed between the two vessels, said resilient stopper including means to intermittently seal the second vessel upper end and being adapted to receive a cannula intermittently so that blood from a subject can be directed into said first vessel;

whereby, said blood is allowed to clot and may be separated by centrifugal means to cause said serum to pass through the filter means and be stored in said space while clot and cellular material remain within the first vessel.

4,131,550

POLYESTER TEXTILE MATERIALS HAVING IMPROVED DURABLE SOIL RELEASE CHARACTERISTICS AND PROCESS FOR PRODUCING SAME

Francis W. Marco, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Jul. 13, 1977, Ser. No. 815,124
Int. Cl.[2] D06M *13/20*
U.S. Cl. 252—8.6 **9 Claims**

1. A process for imparting durable soil release characteristics to a textile material formed of polyester fibers which comprises padding a textile material with an effective amount of an aqueous emulsion consisting essentially of from about 0.15 to about 4 weight percent of a synthetic acid emulsion polymer, said polymer having at least about 20 weight percent acid calculated as acrylic acid, and from about 0.05 to about 0.4 weight percent of a water-soluble salt wherein the cation moiety of said salt is a polyvalent metal ion selected from the group consisting of Mg^{++}, Ba^{++}, and Ca^{++} and the anion moiety of said salt is selected from the group consisting of halogen and the anion moiety of an organic acid in which the pK value of said organic acid is from about 3 to about 5 so as to provide a resulting wet textile material containing from about 0.25 to about 5 weight percent solids, said solids being a combination of said polymer and said salt; drying said resulting wet textile material for a period of time sufficient to remove substantially all of the water therefrom; and, heating the dry textile material to a temperature of from about 280° F. to about 450° F. for a time sufficient to cure said polymer containing said salt.

4,131,551

RAILWAY LUBRICATING OIL

Jerry L. Thompson, Wheaton, Ill.; Sigmund S. Deluga, Munster; James W. Harnach, Chesterton, both of Ind., and Eliahu Shamah, Naperville, Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Aug. 15, 1977, Ser. No. 824,263
Int. Cl.[2] C10M *1/40, 3/34, 5/22, 7/38*
U.S. Cl. 252—33 **14 Claims**

1. An improved lubricant composition comprising:

(a) from about 90 to about 83 weight percent of a lubricant mineral base oil,

(b) from about 1.9 to about 3.4 weight percent of an alkyl phenol Mannich condensation product comprising the reaction product with formaldehyde and a polyamine,

(c) from about 1.0 to about 3.0 weight percent of alkaline earth metal salt of the Mannich condensation reaction product comprising an alkyl phenol Mannich condensation product with formaldehyde and a polyamine,

(d) 2.0 to about 6.0 weight percent of an overbased alkaline earth metal alkyl benzene sulfonate having a TBN of at least 1,

(e) from about 2.5 to about 7.0 weight percent of an overbased alkaline earth salt of the bis-alkyl phenol sulfide,

(f) about 0.15 to 2.0 weight percent of a chlorinated paraffin, and

(g) about 1 to about 25 parts per million based on the lube oil composition of a polydimethyl siloxane.

4,131,552
HIGH TEMPERATURE RELEASE AND LUBRICATING COMPOSITIONS FOR GLASS MOLDS

Arnold F. Marcantonio, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Continuation of Ser. No. 579,350, May 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 445,756, Feb. 25, 1974, abandoned. This application Oct. 13, 1977, Ser. No. 841,795

Int. Cl.[2] **C10M** *1/10, 3/02, 5/02, 7/04*

U.S. Cl. 252—29 **10 Claims**

1. A release and lubricating composition comprising a dispersion of about 0.5 to about 20 weight percent polyphenylene sulfide, about 0.2 to about 60 weight percent graphite and about 20 to about 99 weight percent of a carrier having a boiling point of about 350° F or greater, said carrier being selected from the group consisting of polyalkylene oxide, epoxidized glyceride and a polyhydric alcohol selected from the group consisting of ethylene glycol, glycerin, sorbitol and mixtures thereof.

9. A release and lubricating composition comprising about 10 weight percent polyphenylene sulfide, about 5 weight percent graphite, about 42 weight percent ethylene glycol, about 42 weight percent water and about 1 weight percent octylphenoxy polyethoxy ethanol.

4,131,553
ALKYLBENZENE SULFONIC ACID MODIFIED MANNICH REACTION PRODUCTS FROM OXIDIZED POLYMERS

C. Thomas West, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 15, 1978, Ser. No. 877,874

Int. Cl.[2] **C10M** *1/40, 3/34, 5/22;* **C08G** *12/04*

U.S. Cl. 252—33 **5 Claims**

1. A process of producing a dispersant-viscosity index improver which comprises reacting:

a high molecular weight oxidized amorphous addition polymer with a formaldehyde yielding reagent, an amine selected from the group consisting of aliphatic primary and secondary amines having from about 2 to 12 carbon atoms, an aliphatic amine of the general formula $NH_2[(CH_2)_zNH)]_xH$ wherein z is an integer from about 2 to about 6 and x is an integer from about 1 to about 10, and about 0.01 to 40.0% by weight of an oil soluble sulfonic acid based on the copolymer, wherein the sulfonic acid is contacted with the oxidized polymer after the amine.

5. A lubricant oil containing an effective amount of the product of the process of claim 1.

4,131,554
OVERBASED BRIDGED PHENOL METAL SALT/HALO CARBOXYLIC ACID CONDENSATE ADDITIVES FOR LUBRICANTS

Thomas F. Steckel, Chagrin Falls, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 608,380, Aug. 27, 1975, Pat. No. 4,067,698. This application Dec. 5, 1977, Ser. No. 857,839

The portion of the term of this patent subsequent to Dec. 5, 1995, has been disclaimed.

Int. Cl.[2] **C10M** *1/54, 3/48, 5/28, 7/52*

U.S. Cl. 252—33.6 **21 Claims**

1. An overbased metal carboxylate made by reacting at least one basically reacting metal compound in the presence of a promoter and an acidic reagent with at least one composition made by reacting (I) at least one phenoxide metal salt of a bridged phenol having (a) at least 2 and up to about 20 phenolic moieties or thiophenol analogs thereof and (b) at least 1 and up to about 19 bridging linkages independently selected from the group consisting of covalent carbon-to-carbon single bonds, ether linkages, sulfide linkages, polysulfide linkages of two to six sulfur atoms, sulfinyl linkages, sulfonyl linkages, methylene linkages, alkylene linkages, di(lower alkyl)methylene linkages, lower alkylene ether linkages, lower alkylene sulfide linkages, lower alkylene polysulfide linkages of two to six sulfur atoms, amino linkages, polyamino linkages and mixtures of said divalent bridging linkages with (II) at least one carboxylic acid reagent having 1 to about 3 carboxyl-based groups and a halogen-substituted hydrocarbon-based aliphatic or alicyclic group containing a halogen atom.

11. A lubricant composition comprising a major amount of at least one oil of lubricating oil viscosity and a minor amount of the composition claimed in claim 1.

4,131,555
DETERGENT COMPOSITION

John B. Hall, Rumson, and Wilhelmus J. Weigers, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

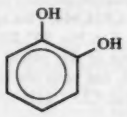
Continuation-in-part of Ser. No. 753,618, Dec. 22, 1976, Pat. No. 4,061,686, which is a continuation-in-part of Ser. No. 662,818, Mar. 1, 1976, Pat. No. 4,014,944. This application Oct. 31, 1977, Ser. No. 847,209

The portion of the term of this patent subsequent to Dec. 26, 1995, has been disclaimed.

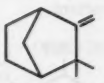
Int. Cl.[2] **C11D** *3/50*

U.S. Cl. 252—89 R **2 Claims**

1. A process for producing a perfumed detergent composition comprising the step of intimately admixing with a solid or liquid detergent base from 1% up to 3% of a product produced by the process which comprises reacting catechol having the structure:



with camphene having the structure:



in the presence of a Friedel Crafts Catalyst to form a catechol-camphene alkylation product, recovering said alkylation product at a temperature in the range of from 186 up to 236° C. and at a pressure of from 2.3 up to 3.8 mm Hg, hydrogenating the said catechol-camphene alkylation product in the presence of a hydrogenation catalyst to form a hydrogenated catechol-camphene addition product and recovering the said hydrogenated catechol-camphene addition product at a temperature in the range of from 150° C. up to 172° C. and a pressure of about 2.5 mm Hg, the Friedel Crafts Catalyst being selected from the group consisting of boron trifluoride etherate, sulfuric acid, acid clay, aluminum trichloride, boron trifluoride, boron trifluoride-acetic acid, boron trifluoride-phosphoric acid, zinc chloride, aluminosilicate molecular sieve, and ferric chloride, the reaction between catechol and camphene being carried out at a temperature in the range of from about 120° C. up to 175° C. and the mole ratio of catechol to camphene being in the range of from about 0.5:1 up to about 4:1, the hydrogenation reaction being carried out within a temperature range of 100° C. up to 300° C., the latter portion of the reaction time being at from 200° up to 300° C.

4,131,556
METHOD FOR MANUFACTURING BROMINE AND BROMINE-IODINE DETERGENTS AND DISINFECTANTS

Alojzy Klopotek; Jerzy Uminski, both of Nowy Dwor Mazowiecki, and Gabriela Dziala, Legionowo, all of Poland, assignors to Instytut Chemii Przemyslowej, Warsaw, Poland

Continuation of Ser. No. 676,972, Apr. 14, 1976, which is a continuation-in-part of Ser. No. 439,755, Feb. 5, 1974, abandoned. This application Nov. 14, 1977, Ser. No. 851,616

Claims priority, application Poland, Feb. 7, 1973, 160631; Feb. 14, 1973, 160732

Int. Cl.² C11D 3/48, 1/72

U.S. Cl. 252—106 **13 Claims**

1. A method for manufacturing a bromine complex of non-ionic detergent the formula of the complex being

$$R\text{—}(OC_nH_{2n})_x\text{—}OH \ldots Br\text{—}Br \ldots HO(C_nH_{2n}O)_x\text{—}R$$

wherein R represents an alkyl, alkylamido, aryl or alkyaryl group having 6 to 32 carbon atoms, each x is an integer from 2 to 50 and represents the number of oxyalkylene groups and n is an integer from 2 to 4, comprising the step of reacting a solution containing $[IBr_2]^-$ ions with a non-ionic surfactant having the formula $R(OC_nH_{2n})_x$—OH, in which R, n and x are as defined above, in a proportion not exceeding 1 mole of $[IBr_2]^-$ ions per each 2 moles of non-ionic surfactant at a temperature in the range of 0°–60° C. under anhydrous or substantially anhydrous conditions to form the bromine complex of the non-ionic detergent.

4,131,557
SOAP COMPOSITION

John B. Hall, Rumson, and Wilhelmus J. Wiegers, Red Bank, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

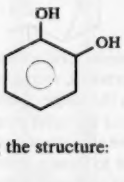
Continuation-in-part of Ser. No. 753,618, Dec. 22, 1976, Pat. No. 4,061,686, which is a continuation-in-part of Ser. No. 662,818, Mar. 1, 1976, Pat. No. 4,014,944. This application Oct. 31, 1977, Ser. No. 847,210

The portion of the term of this patent subsequent to Dec. 26, 1995, has been disclaimed.

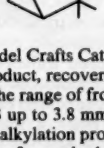
Int. Cl.² C11D 9/44

U.S. Cl. 252—132 **2 Claims**

1. A process for preparing a perfumed soap comprising the step of admixing soap chips with from 1% up to 3% of a product produced by the process which comprises reacting catechol having the structure:



with camphene having the structure:



in the presence of a Friedel Crafts Catalyst to form a catechol-camphene alkylation product, recovering said alkylation product at a temperature in the range of from 186 up to 236° C. and at a pressure of from 2.3 up to 3.8 mm Hg, hydrogenating the said catechol-camphene alkylation product in the presence of a hydrogenation catalyst to form a hydrogenated catechol-camphene addition product and recovering the said hydrogenated catechol-camphene addition product at a temperature in the range of from 150° C. up to 172° C. and a pressure of about 2.5 mm Hg, the Friedel Crafts Catalyst being selected from the group consisting of boron trifluoride etherate, sulfuric acid, acid clay, aluminum trichloride, boron trifluoride, boron trifluoride-acetic acid, boron trifluoride-phosphoric acid, zinc chloride, aluminosilicate molecular sieve, and ferric chloride, the reaction between catechol and camphene being carried out at a temperature in the range of from about 120° C. up to 175° C. and the mole ratio of catechol to camphene being in the range of from about 0.5:1 up to about 4:1, the hydrogenation reaction being carried out within a temperature range of 100° C. up to 300° C., the latter portion of the reaction time being at from 200 up to 300° C.

4,131,558
PROCESS FOR PREPARING AN ORTHOPHOSPHATE-SILICATE DETERGENT PRODUCT

John Bailey, Ryton; Michael J. Randell, and Paul R. Sherrington, both of Newcastle upon Tyne, all of England, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Feb. 12, 1976, Ser. No. 657,656

Claims priority, application United Kingdom, Feb. 14, 1975, 6358/75; Jun. 16, 1975, 25645/75

Int. Cl.² C11D 3/065, 7/54

U.S. Cl. 252—135 **16 Claims**

1. A process for forming a detergent composition consisting essentially of the steps of:

(1) forming an aqueous slurry comprising

(a) from about 1% to about 30% on a dry weight basis of an alkali metal silicate having the formula $SiO_2:M_2O$, wherein the $SiO_2:M_2O$ molar ratio is from about 1.6:1 to about 4:1, and M is an alkali metal or mixtures thereof;

(b) from about 0% to about 60% on a dry weight basis of an alkali metal orthophosphate having the formula $M_xH_y(PO_4)$ and the sum of $x + y$ are integers equal to 3; M is an alkali metal or mixtures thereof;

(c) from 0% to about 80% on a dry weight basis of a diluent selected from the group consisting of alkali metal carbonates, bicarbonates, sesquicarbonates, chlorides, borates, perborates, sulfates, bisulfates and aluminates, calcium carbonate, montmorillonite, hectorite, saponite, volchonskoite, nontronite, and sauconite and mixtures thereof;

(d) from about 1% to about 50% on a dry weight basis of an anionic, nonionic, zwitterionic, or ampholytic, detergent and mixtures thereof; then,

(2) drying the slurry of (1) to an $SiO_2:H_2O$ molar ratio of greater than about 0.5; and,

(3) admixing from about 0% to about 60% on a dry weight basis of the material described in (1) (b) to give a detergent composition containing from about 5% to about 60% by weight $M_3(PO_4)$ wherein M is an alkali metal, the amount of tripolyphosphate in said composition being less than 20% by weight of the amount of orthophosphate.

4,131,559
AZEOTROPIC COMPOSITIONS

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 780,194, Mar. 22, 1977, Pat. No. 4,092,262, which is a division of Ser. No. 609,115, Aug. 29, 1975, Pat. No. 4,035,258, which is a division of Ser. No. 391,663, Aug. 27, 1973, Pat. No. 3,936,387, which is a continuation-in-part of Ser. No. 223,779, Feb. 4, 1972, abandoned. This application Dec. 23, 1977, Ser. No. 864,057

Int. Cl.² C11D 7/50, 7/30; C23G 5/02

U.S. Cl. 252—171 **6 Claims**

1. The azeotrope which at substantially atmospheric pressure is characterized as about 95 weight percent 1,2-dichloro-1,2-difluoroethane and about 5 weight percent ethanol.

4. The azeotrope which at substantially atmospheric pressure is characterized as about 98.7 weight percent 1,2-dichloro-1,2-difluoroethane and 1.3 weight percent isopropanol.

4,131,560
AZEOTROPIC COMPOSITIONS

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 780,194, Mar. 22, 1977, Pat. No. 4,092,262, which is a division of Ser. No. 609,115, Aug. 29, 1975, Pat. No. 4,035,258, which is a division of Ser. No. 391,663, Aug. 27, 1973, Pat. No. 3,936,387, which is a continuation-in-part of Ser. No. 223,779, Feb. 4, 1972, abandoned. This application Dec. 23, 1977, Ser. No. 863,977

Int. Cl.[2] C11D *7/50, 7/30;* C23G *5/02*

U.S. Cl. 252—171 3 Claims

1. The azeotrope which at substantially atmospheric pressure is characterized as about 45.9 weight percent 1,2-dichloro-1,2-difluoroethane and about 54.1 weight percent tetrahydrofuran.

4,131,561
AZEOTROPIC COMPOSITIONS

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 780,194, Mar. 22, 1977, Pat. No. 4,092,262, which is a division of Ser. No. 609,115, Aug. 29, 1975, Pat. No. 4,035,258, which is a division of Ser. No. 391,663, Aug. 27, 1973, Pat. No. 3,936,387, which is a continuation-in-part of Ser. No. 223,779, Feb. 4, 1972, abandoned. This application Dec. 23, 1977, Ser. No. 863,978

Int. Cl.[2] C11D *7/50, 7/30;* C23G *5/02*

U.S. Cl. 252—171 6 Claims

1. The azeotrope which at substantially atmospheric pressure is characterized as about 39.8 weight per cent 1,2-dichloro-1,2-difluoroethane and about 60.2 weight per cent methyl ethyl ketone.

4. The azeotrope which at substantially atmospheric pressure is characterized as about 72.3 weight per cent 1,2-dichloro-1,2-difluoroethane and about 27.7 weight per cent acetone.

4,131,562
STABILIZED PARTICULATE PEROXYGEN COMPOUNDS

Charles W. Lutz, Princeton, and Leon E. Cohen, Somerset, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Jun. 17, 1977, Ser. No. 807,629

Int. Cl.[2] C01B *15/10;* C11D *3/39, 7/18, 7/54*

U.S. Cl. 252—186 4 Claims

1. A particulate peroxygen compound selected from the group consisting of sodium carbonate peroxide, sodium perborate and mixtures thereof coated with from about 0.1 to about 3.0 weight percent of an ethylene oxide-derivative stabilizing material selected from the group consisting of:

(a) polyethoxy alcohols having the general formula:

$$RO(CH_2CH_2O)_nH$$

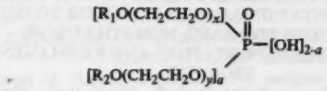
wherein n is an integer of from 4 to 25 and R is selected from primary and secondary linear alkyl and alkenyl radicals having from 10 to 18 carbon atoms and alkylphenyl radicals in which the alkyl moiety is linear, having from 8 to 18 carbon atoms;

(b) polyethoxy thioethers having the general formula:

$$RS(CH_2CH_2O)_nH$$

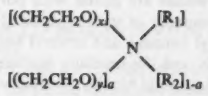
wherein n is an integer of from 4 to 20, and R is a linear alkyl or alkenyl radical having from 10 to 18 carbon atoms;

(c) polyethoxy phosphoric acid esters having the general formula:



wherein a is either 0 or 1; and for a=1, x and y are the same or different integers of from 2 to 10, and R_1 and R_2 are the same or different and are selected from linear alkyl radicals having from 8 to 18 carbon atoms and alkylphenyl radicals in which the alkyl moiety is linear, having from 8 to 18 carbon atoms; and for a=0, x is an integer of from 4 to 20 and R_1 is selected from linear alkyl radicals having from 8 to 18 carbon atoms and alkylphenyl radicals in which the alkyl moiety is linear, having from 8 to 18 carbon atoms;

(d) polyethoxy fatty acid tertiary amines and quaternary ammonium salts thereof wherein the tertiary amines have the general formula:



wherein a is either 0 or 1; and for a=1, x and y are the same or different integers of from 1 to 30, and R_1 is a linear alkyl or alkenyl radical having from 10 to 18 carbon atoms; and for a=0, x is an integer of from 1 to 60 and R_1 and R_2 are the same or different linear alkyl or alkenyl radicals having from 10 to 18 carbon atoms;

(e) ethoxy propoxy block copolymeric alcohols having the general formula:

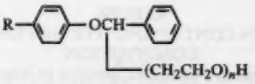
$$RO(CH(CH_3)CH_2O)_m(CH_2CH_2O)_nH$$

wherein m and n are the same or different integers of from 4 to 100 such that the weight percent of the ethylene oxide exceeds 20%, up to about 80%, of the molecular weight and R is $HOCH(CH_3)CH_2$— or $HOCH_2CH_2$—;

(f) alkylphenoxy polyethoxy alcohols having the general formula:

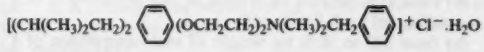
wherein n is an integer of from 8 to 40 and R is a branched alkyl radical containing from 8 to 9 carbon atoms;

(g) α-phenoxy-α-benzylpolyethoxy alcohols having the general formula:



wherein n is an integer of from 8 to 40 and R is a branched alkyl radical containing from 8 to 9 carbon atoms;

(h) diisobutylphenoxyethoxyethyl dimethylbenzyl ammonium chloride monohydrate having the general formula:



4,131,563

PROCESS OF PREPARING SUBSTANTIALLY SOLID WASTE CONTAINING RADIOACTIVE OR TOXIC SUBSTANCES FOR SAFE, NON-POLLUTIVE HANDLING, TRANSPORTATION AND PERMANENT STORAGE

Werner Bähr, Speyer; Stefan Drobnik, Blankenloch; Werner Hild, Hochstetten; Reinhard Kroebel, Leopoldshafen; Alfred Meyer, Cologne, and Günter Naumann, Leverkusen, all of Germany, assignors to Steag Kernenergie G.m.b.H., Essen, Germany

Continuation of Ser. No. 534,773, Dec. 20, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,552

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1973, 2363475

Int. Cl.² G21F *9/34*

U.S. Cl. 252—301.1 W **11 Claims**

1. In the process of preparing substantially solid wastes containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage, by bringing the solid wastes into contact with hardening materials and hardening the same into solid masses, the improvement wherein the solid wastes are mixed with polymerizable mixtures consisting essentially of styrene selected from the group consisting of divinyl benzene and trivinyl benzene, and polymerization catalysts, and the resulting mixtures are converted by polymerization into solid blocks, the solid wastes being used in quantities of from 2% to 75% by weight, based on the total weight of the wastes + polymerization mixture, the styrene being used in quantities of from 70% to 99.5% by weight, based on the weight of the monomers, the polyvinyl compounds being used in quantities of from 1.0% to 30% by weight, based on the weight of monomers, and the polymerization catalysts being used in quantities of from 0.1% to 6% by weight, based on the weight of the monomers.

4,131,564

LIGNIN-CONTAINING DYE DISPERSING COMPOSITION

Peter Dilling, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Continuation of Ser. No. 716,511, Aug. 23, 1976, abandoned. This application May 24, 1978, Ser. No. 909,122

Int. Cl.² B01F *17/12*

U.S. Cl. 252—353 **2 Claims**

1. A low viscosity, heat stable dye dispersant composition having reduced tendency to stain fibers consisting of,

(a) from 97% to 10% by weight of said composition of a sulfonated kraft lignin, and

(b) from 3% to 90% by weight of said composition of a formaldehyde condensed naphthalene sulfonate.

4,131,565

PROCESS FOR REACTIVATING SPENT ACTIVATED-CARBON

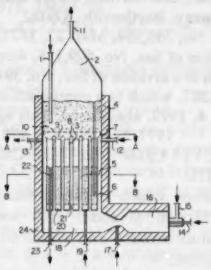
Masakazu Komori, 1591-47 Hiratocho, Totsuka-ku, Yokohama-shi, Kanagawa; Kazuyuki Shiga, 6-12-23, Minamishinagawa, Shinagawa-ku, Tokyo; Hajime Kitazato, 205, Sasanodai, Asahi-ku, Yokohama-shi, Kanagawa; Hiroaki Okajima, 3-20-4, Jujonakahara, Kita-ku, Tokyo; Yoshiharu Tanaka, 225-7 Oogami, Ayase-cho, Kouza-gun, Kanagawa; Shoiti Nojima, 1-15-16, Sakurajosui, Setagaya-ku, Tokyo; Masashige Fukamachi, 1024-413, Shimonagaya, Konan-ku, Yokohama-shi, Kanagawa, and Akinori Kurima, 2-181 Iwamacho, Hodogaya-ku, Yokohama-shi, Kanagawa, all of Japan

Continuation-in-part of Ser. No. 326,170, Jan. 24, 1973, abandoned. This application Apr. 7, 1975, Ser. No. 565,782

Claims priority, application Japan, Jan. 24, 1972, 47-8917; Jun. 28, 1972, 47-64678; Jan. 24, 1972, 47-8918; Sep. 6, 1972, 47-88738

Int. Cl.² B01D *15/06*

U.S. Cl. 252—417 **6 Claims**



1. A process for the reactivation of spent activated-carbon, which comprises the steps of introducing spent activated carbon into a first devolatilization zone, fluidizing and directly heating said spent carbon in said first zone at a temperature between 100° and 700° C. with a gas from a second activation zone to remove volatiles from said spent carbon, transferring the carbon so treated to the second activation zone, indirectly heating said carbon in said second zone at a temperature between 500° to 1000° C. with a hot combustion gas while fluidizing said carbon in the substantial absence of oxygen with steam or a steam-containing inert gas to reactivate said carbon, the off gas from said indirect heating in said second zone being combined with the off gas from said reactivation in said second zone and used for fluidizing and heating said spent carbon in said first zone, and recovering the reactivated carbon from said second zone.

4,131,566

GRANULAR ACTIVATED CARBON MANUFACTURE FROM LOW RANK AGGLOMERATING BUT NOT GOOD COKING BITUMINOUS COAL TREATED WITH DILUTE INORGANIC ACID

Hari N. Murty, Grand Island, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 587,754, Jun. 17, 1975, abandoned. This application Jul. 25, 1977, Ser. No. 818,699

Int. Cl.² C01B *31/10, 31/08;* **B01J** *21/18*

U.S. Cl. 252—423 **16 Claims**

1. A process for making hard granular activated carbon having an abrasion number of not less than about 70 comprising:

forming granules from low rank agglomerating but not good coking bituminous coal;

treating the granules with a dilute aqueous solution of inorganic acid to prevent fusion of the granules during subsequent devolatilization comprising: mixing the granules with the acid for a time and at a temperature, acid concen-

tration and solution to coal ratio sufficient to prevent said fusion, washing off the acid, drying the granules thoroughly, and thereafter mixing the granules with a carbonaceous binder;
reducing the treated granules to form fine powder;
compressing the powder to form shapes;
reducing the shapes to reform granules;
charring the reformed granules by heating to and at a charring temperature in an oxygen containing atmosphere;
devolatilizing the charred granules by heating to and at a devolatilizing temperature higher than the charring temperature in an oxygen-free atmosphere; and
activating the devolatilized granules by heating to and at an activating temperature higher than the devolatilizing temperature in an atmosphere containing a gaseous activating agent.

2. Hard granular activated carbon made by the process of claim 1.

10. The process of claim 1 wherein the reformed granules are charred by heating to a temperature of about 250° C at a rate of about 150° C/hour in an atmosphere of air and nitrogen and by maintaining the charring temperature for a time of about 4 to about 5 hours.

11. The process of claim 1 wherein the charred granules are devolatilized by heating to a temperature of about 450° C at a rate of about 300° C/hour in an atmosphere of N_2 and the volatilie and by maintaining the devolatilizing temperature for a time of about 1 hour.

12. The process of claim 1 wherein the devolatilized granules are activated by heating to a temperature of about 800 to about 900° C in an atmosphere of N_2 and steam and by maintaining the activating temperature for a time of about 4 to about 5 hours.

4,131,567

CATALYST FOR CATIONIC POLYMERIZATION PROCESS

Ronald T. Wojcik, Stamford, Conn., assignor to Arizona Chemical Company, New York, N.Y.

Division of Ser. No. 775,503, Mar. 3, 1977, Pat. No. 4,098,982. This application Oct. 27, 1977, Ser. No. 845,992

Int. Cl.² B01J *27/16*

U.S. Cl. 252—435 **4 Claims**

1. A polymerization catalyst system adopted for use in the polymerization of piperylene which consists essentially of: (a) a major amount ranging from about 70%, to 85%, by weight, of aluminum chloride, aluminum bromide or mixtures of the same and (b) a minor amount ranging from about 15% to 30%, by weight, of an inorganic phosphorus acid selected from the class consisting of phosphoric acid, meta-phosphoric acid, and phosphorous acid.

4,131,568

CATALYTIC SYNTHESIS OF LOW MOLECULAR WEIGHT HYDROCARBONS

Charles M. Bartish, Bethlehem, Pa., assignor to Air Product and Chemicals, Inc., Allentown, Pa.

Filed Aug. 14, 1975, Ser. No. 604,633

Int. Cl.² B01J *29/06;* **C07C** *27/06*

U.S. Cl. 252—455 Z **4 Claims**

1. A catalyst composition comprising from about 100 to 1 parts iron per part copper carried on a support containing at least 5%–50% zeolite.

4,131,569

OXIDIC CATALYST FOR THE CONVERSION OF WATER GAS

Alfred Michel; Hans-Joachim Henkel; Christian Koch, all of Erlangen, and Hana Kostka, Grossgründlach, all of Germany, assignors to Siemens Aktiengeselischaft, Munich, Germany

Filed Sep. 23, 1977, Ser. No. 836,222

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643916

Int. Cl.² B01J *23/10, 23/76, 21/04*

U.S. Cl. 252—462 **8 Claims**

1. An oxidic catalyst for the conversion of water gas consisting of oxides of the metals aluminum, lanthanum, cobalt, nickel and uranium, the aluminum oxide being present predominantly as α-Al_2O_3, said aluminum oxide acting as a carrier for the oxides of the metals lanthanum, cobalt, nickel and uranium, and with a lanthanum and cobalt content of 5 to 30% by weight, a nickel content of 0.1 to 4% by weight, and a uranium content of 0.1 to 2% by weight, always related to the total weight of the catalyst.

4,131,570

METHOD FOR THE MANUFACTURE OF A SILVER CATALYST FOR ELECTROCHEMICAL CELLS AND THE CATALYST PREPARED BY THE METHOD

Karl Höhne, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 23, 1978, Ser. No. 880,341

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1977, 2713855

Int. Cl.² B01J *23/68, 23/80;* **B01S** *23/84*

U.S. Cl. 252—473 **6 Claims**

1. In a method for preparing a silver catalyst suitable for use as electrode material for electrochemical cells wherein a silver salt is reduced to precipitate metallic silver on a commingled mixture of hydroxides of bismuth, nickel and titanium, the content of said hydroxides being from about 0.5 to 5% by weight based upon the amount of silver present in the finished catalyst, the improvement comprising simultaneously reducing a mercury salt along with the silver salt to precipitate a metallic silver-mercury alloy on said mixture of hydroxides, the mercury content of the finished catalyst being between about 10 to about 17% by weight based upon the total weight of the catalyst.

4,131,571

POLYURETHANE METALLIC ENAMEL

Keenan L. Crawley, Hope, Ark., and Lester I. Miller, Troy, Mich., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

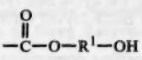
Continuation-in-part of Ser. No. 645,216, Dec. 29, 1975, abandoned. This application Oct. 19, 1977, Ser. No. 844,107

Int. Cl.² C08L *1/14*

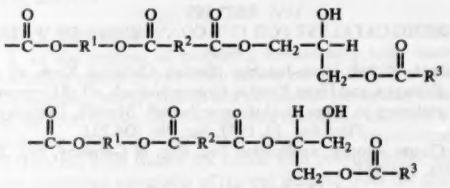
U.S. Cl. 260—17 R **9 Claims**

1. A coating composition having a solids content of 5–60% by weight in an organic liquid; wherein the solids consist essentially of

(1) 50–95% by weight of an acrylic polymer having a backbone consisting essentially of polymerized monomers of the group of methyl methacrylate, styrene or mixtures thereof and polymerized ethylenically unsaturated ester monomers that form ester groups pending from the carbon atoms of the polymer backbone and comprise about 10 to 75% of the total weight of the polymer and consisting essentially of ester group (A)



and ester group (B) selected from the group consisting of



or mixtures thereof, wherein the molar ratio of ester group (A) to ester (B) is from about 1:1.5 to 1:2.5; and wherein

R^1 is a saturated hydrocarbon group having 2–4 carbon atoms,

R^2 is phenylene,

R^3 is a tertiary hydrocarbon group having 8 through 10 carbon atoms;

(2) 1–15% by weight of cellulose acetate butyrate having a butyryl content of about 50–60% by weight, a hydroxyl content of about 1.0–3.0% by weight, and a viscosity of 0.02–0.5 seconds measured at 25° C. according to ASTM D-1343-56;

(3) 0.05–1.0% by weight of an alkyl acid phosphate having 1–12 carbon atoms in the alkyl group;

(4) 0.2–20% by weight of aluminum flake pigment;

(5) 0.01–5% by weight of an ultraviolet light absorbing agent from the group of a substituted benzotriazole, a substituted benzophenone or a mixture thereof;

(6) 0.01–0.10% by weight of an alkyl tin laurate catalyst; and

(7) 3.73–48.73% by weight of a polyisocyanate of the biuret of an alkylene diisocyanate having 1–6 carbon atoms in the alkylene group.

4,131,572

POWDER COATINGS CONTAINING COPOLYMER CONTAINING ISOBORNYL METHACRYLATE AS MELT FLOW MODIFIER

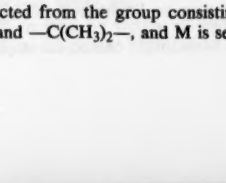
William H. Brendley, Jr., Hatboro, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 108,996, Jan. 22, 1971, abandoned. This application May 16, 1975, Ser. No. 578,441

Int. Cl.[2] C08L *1/10*

U.S. Cl. 260—17 R **12 Claims**

1. A fluidizable powder coating composition, the particles of which are from about 10 to about 500 microns in diameter, a mixture of (A) about 3 to 10 parts by weight of a melt flow-modifying copolymer of about 40 percent to 60 percent by weight of a compound of the formula:



where R is selected from the group consisting of $—CH_2—$, $—CH(CH_3)—$, and $—C(CH_3)_2—$, and M is selected from the group consisting of a hydrogen atom and at least one methyl group, and 40 percent to 60 percent by weight of styrene, vinyl toluene, or at least one ester of acrylic acid or methacrylic acid and an aromatic, monocyclic aliphatic, or open chain aliphatic alcohol or alkoxy alcohol having from 1 to about 18 carbon atoms, or combinations thereof, said copolymer having an average molecular weight of from 1,000 to 8,500, and (B) 90 to 97 parts by weight of a thermoplastic coating resin selected from the group consisting of cellulose esters, polyvinylhalides, and acrylics.

4,131,573

PROCESS FOR MAKING LIGNIN GELS IN BEAD FORM

Wynford Brown, Uppsala, Sweden, assignor to Westvaco Corporation, New York, N.Y.

Filed Feb. 4, 1977, Ser. No. 765,683

Int. Cl.[2] C08H *5/02*

U.S. Cl. 260—17.5 **13 Claims**

1. A process for making high molecular weight cross-linked lignin gel beads which comprises:

(a) providing an aqueous solution containing a lignin from the group consisting of alkali lignin and desulfonated sulfite waste liquor lignin;

(b) agitating said aqueous lignin solution with a water-immiscible organic solvent to form an emulsion comprising aqueous droplets containing said lignin within the continuous phase of said organic solvent;

(c) reacting with said lignin a cross-linking agent capable of reacting with the hydroxyl groups of said lignin with the formation of ether bridges, said cross-linking agent being selected from the group consisting of epichlorohydrin, dichlorohydrin, 1,2,3,4-diepoxy-butane, bis-epoxy propyl ether, ethylene glycol-bis-epoxy propyl ether and 1,4-buta-diol-bis-epoxy propyl ether;

(d) said reaction being catalyzed in the presence of alkali;

(e) said droplets being maintained until gel formation has taken place as the result of the reaction of said lignin with said cross-linking agent in the presence of said alkali; and

(f) recovering the gel beads of the cross-linked lignin from said reaction.

4,131,574

STARCH

Harold Isherwood, Bewdley, and John T. Shaw, Brierley Hill, both of England, assignors to British Industrial Plastics Ltd., Manchester, England

Filed Jul. 7, 1977, Ser. No. 813,556

Claims priority, application United Kingdom, Jul. 9, 1976, 28588/76

Int. Cl.[2] C08L *3/02, 3/10*

U.S. Cl. 260—17.3 **4 Claims**

1. In a process for the manufacture of starch solution which comprises forming a slurry of substantially raw starch in water; adding to the slurry a conventional starch oxidising agent; and subjecting the slurry, in the presence of the oxidising agent, to mechanical shear at elevated temperature in the range of about 110° to about 180° C., the improvement which consists in adding to the slurry, before the slurry is subjected to mechanical shear at elevated temperature, an amino-formaldehyde resin in an amount forming from about 2 to about 30% by weight of the total weight of dry starch in the slurry.

4,131,575

THERMOPLASTIC POLYCARBONATE MOLDING MATERIALS WITH IMPROVED MOLD RELEASE

Siegfried Adelmann; Dieter Margotte; Hugo Vernaleken, and Werner Nouvertné, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen Bayerwerk, Germany

Continuation-in-part of Ser. No. 656,233, Feb. 9, 1976, abandoned. This application Feb. 17, 1977, Ser. No. 769,725

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1975, 2507748; Jan. 18, 1977, 2701725

Int. Cl.[2] C08L *69/00*

U.S. Cl. 260—17.4 R 14 Claims

1. Thermoplastic molding materials comprising high molecular weight, thermoplastic, aromatic polycarbonates based on aromatic dihydroxy compounds and containing from about 0.01 to 0.1% by weight of esters of saturated aliphatic carboxylic acids with 10 to 20 C atoms and aliphatic 4-hydric to 6-hydric alcohols.

4,131,576

PROCESS FOR THE PREPARATION OF GRAFT COPOLYMERS OF A WATER SOLUBLE MONOMER AND POLYSACCHARIDE EMPLOYING A TWO-PHASE REACTION SYSTEM

Carmine P. Iovine, and Dilip K. Ray-Chaudhuri, both of Bridgewater, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Dec. 15, 1977, Ser. No. 860,951

Int. Cl.[2] C08L *51/02*

U.S. Cl. 260—17.4 GC 11 Claims

1. A process for the production of a graft copolymer of a polysaccharide and water-soluble monomer comprising the steps of:

(a) suspending the polysaccharide in an organic solvent, which solvent has a boiling point at or above the temperature of the polymerization reaction, is immiscible with water and does not dissolve the polysaccharide, monomer or graft copolymer;

(b) adding thereto an aqueous solution of the monomer thereby forming a suspension of discrete aqueous spheres in the organic solvent phase;

(c) deoxygenating and heating the reaction mixture in the presence of a free radical polymerization catalyst to a temperature of 40 to 100° C. to initiate polymerization;

(d) continuing the polymerization for from 0.5 to 6 hours; and

(e) isolating the resultant graft copolymer from the reaction mixture in the form of solid beads; wherein it is required that either the aqueous solution or the polysaccharide suspension or both contain a cationic, anionic or nonionic surfactant, that the solids content of the aqueous polymerization mixture is greater than 50% by weight, and that the polysaccharide be present in the final graft copolymer in an amount of from 10 to 90% by weight.

4,131,577

REINFORCED PLASTIC COMPOSITIONS CONTAINING GRAFT COPOLYMERS

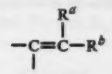
Donald R. Lachowicz, Fishkill, and Charles B. Holder, Wappinger Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 526,200, Nov. 22, 1974, Pat. No. 4,065,521, which is a continuation-in-part of Ser. No. 335,858, Feb. 26, 1973, abandoned, and Ser. No. 335,587, Feb. 26, 1973, abandoned. This application Mar. 4, 1977, Ser. No. 774,571

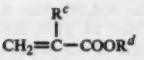
Int. Cl.[2] C08L *9/00, 23/00*

U.S. Cl. 260—17.4 CL 4 Claims

1. A reinforced thermoplastic composition comprising from about 60 to about 90 percent by weight of of a polyolefin and uniformly dispersed throughout the said polyolefin polymer from 10 to about 40 percent by weight of a reinforcing material selected from the group consisting of alpha-cellulose and a siliceous reinforcing agent, the said reinforcing material being coated with a graft copolymer comprising a backbone polymer having a hydrocarbon chain portion and a plurality of pendant hydrocarbon groups each containing a moiety of the formula:



wherein R^a and R^b are independently selected from the group consisting of hydrogen and alkyl of from 1 to 16 inclusive carbon atoms, having grafted thereon an acrylate of the formula:



wherein R^c is selected from the group consisting of hydrogen and alkyl of from 1 to 3 inclusive carbon atoms and R^d is alkyl of from 1 to 30 inclusive carbon atoms, to form a graft copolymer, wherein the said backbone polymer is 1,2-polybutadiene and wherein about 5 to about 80 percent by weight of the graft copolymer is 1,2-polybutadiene with the balance being the said acrylate.

4,131,578

AQUEOUS HYDRAULIC CEMENT SLURRY

Oliver W. Crinkelmeyer, Kilgore, Tex., and Earl F. Morris, Wagoner, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 546,845, Feb. 3, 1975, abandoned. This application Aug. 12, 1977, Ser. No. 824,022

Int. Cl.[2] C04B *7/02, 7/354*

U.S. Cl. 260—17.5 13 Claims

1. A hydraulic cement slurry composition which comprises:

(a) hydraulic cement, and the following expressed as parts by weight per 100 parts of said hydraulic cement;

(b) water, from about 25 to about 100 parts;

(c) from about 1 to about 5 parts of a compound selected from the group consisting of a lignosulfonate, a lignoamine or a mixture thereof;

(d) from about 0.5 to about 8 parts of a polyamine compound having an average molecular weight of at least about 1400, provided that when said polyamine compound is predominately a polyalkylenepolyamine, said range is from about 2 to about 8 parts; and

(e) a composition selected from the group consisting of a water soluble carbonate, bicarbonate, or mixture thereof, in an amount from that which is effective to enhance the fluid loss property of said slurry up to about 3 parts.

4,131,579

LOW-VISCOSITY AIR-DRYING ALKYD RESINS

Hans-Dieter Mummenthey, Wiesbaden, and Hannes Fischer, Taunusstein, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 24, 1977, Ser. No. 827,143

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637955

Int. Cl.[2] C09D *3/64*

U.S. Cl. 260—22 EP 11 Claims

1. An air-drying alkyd resin, based on A) a dicarboxylic acid; B) a non-drying monocarboxylic acid; C) a drying fatty acid; and D) at least one compound selected from the group consisting of D1) polyhydric, at least trihydric alcohol, and D2) mixtures of D1) with up to 20% by weight, based on the total weight of the alkyd resin, of at least one dihydric alcohol; modified by an additional reaction with at least one monofunctional monomeric oxirane compound and having a viscosity of

not more than 450 mPa.s (measured in a 60% xylene solution at 20° C.) and having an acid number of not more than 15.

4,131,580

WATER-BASED COATING COMPOSITIONS COMPRISING A VINYL ADDITION POLYMER AND AN ACRYLIC ESTER OF DICYCLOPENTADIENE

William D. Emmons, Huntingdon Valley; Kayson Nyi, Sellersville, and Peter R. Sperry, Doylestown, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 664,597, Mar. 8, 1976, abandoned. This application Nov. 14, 1977, Ser. No. 851,325

The portion of the term of this patent subsequent to Jan. 31, 1995, has been disclaimed.

Int. Cl.[2] C08L *33/08, 33/12*

U.S. Cl. 260—29.6 RW **22 Claims**

1. A composition adapted to coat and/or impregnate a substrate consisting essentially of an aqueous dispersion of (a) a vinyl addition polymer, (b) at least one of dicyclopentenyl acrylate or dicyclopentenyl methacrylate, the proportion of the latter being from about 1% to 200% by weight, based on the weight of the polymer, and (c) an effective amount of a polyvalent metal-containing complex or salt that catalyzes the oxidative curing of (a) and (b).

4,131,581

ADHESIVE COMPOSITIONS CONSISTING ESSENTIALLY OF A VINYL ALCOHOL POLYMER, A CRYSTALLINE SOLVENT AND A VISCOSITY REDUCING DILUENT

James N. Coker, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 749,986, Dec. 13, 1976, abandoned, which is a continuation-in-part of Ser. No. 640,782, Dec. 15, 1975, abandoned. This application Mar. 14, 1977, Ser. No. 777,321

Int. Cl.[2] C08L *29/04*

U.S. Cl. 260—29.1 R **45 Claims**

1. An adhesive composition consisting essentially of (1) about 2 to 35 percent by weight of a polymer selected from the group consisting of polyvinyl alcohol and ethylene/vinyl alcohol copolymers containing at least 50 mol percent vinyl alcohol, (2) about 10 to 80 percent by weight of at least one solvent for said polymer, which solvent is crystalline at 40° C. and is selected from the group consisting of urea, solid alkyl substituted ureas containing a total of up to 9 carbon atoms, thiourea, biuret, ϵ-caprolactam, solid aliphatic amides containing up to 6 carbon atoms, solid polyhydric compounds and ammonium carboxylate salts, (3) about 5 to 80 percent by weight of at least one viscosity reducing diluent selected from the group consisting of water, liquid polyhydric compounds, liquid alkyl substituted ureas having up to 9 carbon atoms in the alkyl group, liquid aliphatic amides containing up to 6 carbon atoms, and dimethyl sulfoxide, and (4) 0 to about 60 percent by weight extender selected from the group consisting of starch, dextrin, clay, silica, carbon black, talc, calcium carbonate, barium sulfate and vinyl polymer latices, provided that when said adhesive composition is a suspension the polymer is polyvinyl alcohol which has a cold water solubles content of less than 10 percent by weight at 25° C. while being soluble in 80° C.-100° C. water.

4,131,582

METHOD FOR PREPARING STABLE AQUEOUS EMULSION OF PHENOLIC RESIN

Yuji Kako, Shizuoka; Toyoji Kiguga, and Tetsuo Sanuki, both of Fujieda, all of Japan, assignors to Sumitomo Durez Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 341,625, Mar. 15, 1973. This application Jun. 24, 1977, Ser. No. 809,949

Claims priority, application Japan, Mar. 14, 1972, 47/25299

Int. Cl.[2] C08L *61/06*

U.S. Cl. 260—29.3 **6 Claims**

1. A process for producing an aqueous emulsion which remains stable at room temperature during long term storage consists essentially of the steps of preparing a phenolic resin by commencing the reaction by heating (1) about 5 to about 100 parts by weight of an phenol and 0 to about 95 parts by weight of a modifier reactive with an aldehyde, and (2) a methylene donor compound in a proportion of more than 0.4 mole per mole of the total amount of said phenol and said modifier, in the presence of a catalyst; introducing a polyacrylamide into the reaction mixture, and then continuing the reaction under the same conditions to produce the stable aqueous emulsion, wherein said polyacrylamide is present in a proportion of about 0.5 to about 60 weight percent of polyacrylamide based on the weight of solids present in the stable emulsion.

4,131,583

CORROSION INHIBITING COMPOSITIONS

Fred P. Boerwinkle, St. Paul, Minn., assignor to Northern Instruments Corporation, Lino Lakes, Minn.

Filed Dec. 1, 1977, Ser. No. 856,410

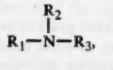
Int. Cl.[2] C23F *11/14*

U.S. Cl. 260—29.6 HN **21 Claims**

10. An aqueous coating composition comprising, in an aqueous medium;

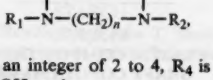
(a) an effective amount of a salt of a carboxylic acid and an organic amine, wherein said acid has 11 to 20 carbon atoms and wherein said amine is selected from the group consisting of:

(i)



where R_1 is alkyl or alkenyl of 11 to 20 carbons, R_2 and R_3 are —H, $-CH_3$ or $-CH_2CH_2OH$; and

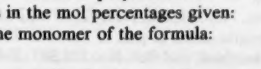
(ii)



where n is an integer of 2 to 4, R_4 is —H, $-CH_3$ or $-CH_2CH_2OH$; and

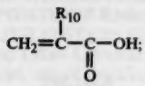
(b) a water dispersible polymer derived from the free-radical-initiated addition polymerication of the following monomers in the mol percentages given:

(i) an amine monomer of the formula:



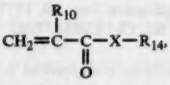
where R_{10} is —H, $-CH_3$ or $-CH_2CH_3$, R_{11} is $-CH_2CH_2-$ or $-CH_2CH_2CH_2-$, R_{12} and R_{13} are H or alkyl of 1 to 4 carbons, X is —O—, —NH— or —S—; present in an amount of about 40 to 100 mol percent;

(ii) an acidic monomer of the formula:



present in a amount ranging from 0 to about 50 mol percent; and

(iii)



where R_{14} is hydrogen or alkyl of 1 to 4 carbons; present in an amount ranging from 0 to about 20 mol percent;

wherein the total mol percent of acidic monomer in said polymer is not greater than the mol percent of said amine monomer.

4,131,584

ELASTOMER LATEX COMPOSITION

Oliver W. Burke, Jr., Fort Lauderdale, and Barbara P. Hunt, Pompano Beach, both of Fla., assignors to Marion Darrah and Joseph Y. Houghton, Co-trustees, Pompano Beach, Fla.

Division of Ser. No. 422,777, Dec. 7, 1973, Pat. No. 4,012,350, which is a division of Ser. No. 219,173, Jan. 19, 1972, Pat. No. 3,922,468. This application Dec. 29, 1976, Ser. No. 754,182

Int. Cl.[2] C08L *23/16*

U.S. Cl. 260—29.6 N **5 Claims**

1. An elastomer latex composition which consists essentially, dry basis by weight, of

(a) 15 parts elastomer latex, and

(b) from 0.2 to 15 parts m-aminophenol,

(c) the elastomer of said latex being selected from the class consisting essentially of the natural rubbers, homopolymers and copolymers of conjugated diene monomers, copolymers of conjugated diene and vinyl monomers, copolymers of ethylene and propylene, terpolymers of ethylene, propylene and nonconjugated diene, and the flurocarbon elastomers, and

(d) said m-aminophenol being selected from the class consisting of m-hydroxyaniline and salts thereof formed with acids having an appreciable water solubility.

4,131,585

LEVELING AGENT FOR FLOOR POLISHES

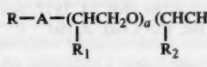
Robert Feigin, West Orange, N.J., assignor to Sybron Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 741,544, Nov. 15, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 898,859

Int. Cl.[2] C09G *1/16*

U.S. Cl. 260—29.6 MQ **3 Claims**

1. A high gloss non-streaking floor polish in emulsion form comprising a polymer selected from a group consisting of homopolymers and copolymers of styrene, acrylic homopolymers and lesser proportions of at least a second polymer and 2.5 to 15% by weight of the total dry polymers a leveling agent having the following formula:



where R = a non-linear aliphatic hydrocarbon or mixture of hydrocarbons containing 8 to 15 carbon atoms in the alkyl chain or an alkylbenzene moiety containing 8 to 12 carbon atoms in the alkyl chain,

A = O, S

R_1 = H, CH_3

R_2 = H, CH_3

a + b = 7 or less so that the solubility of the compounds is less than about 0.4% in water at room or application temperature but when R is an alkylbenzene moiety, A is oxygen atom only and R_1 and R_2 are hydrogen atoms.

4,131,586

POLYMERIC HYDROXYALKYL SULFONATES

Henry S. Makowski, Scotch Plains, and Charles P. O'Farrell, Clark, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

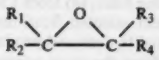
Filed Nov. 29, 1977, Ser. No. 855,763

Int. Cl.[2] C08K *5/10*

U.S. Cl. 260—31.2 R **35 Claims**

1. A process for preparing a solid, gel-free ionomer which consists essentially of:

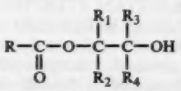
(a) reacting a polymer having one or more sulfonic acid groups covalently bonded to one or more carbon atoms in one or more molecules with an oxirane to form a polymeric hydroxyalkyl sulfonate said oxirane having the general formula:



wherein R_1, R_2, R_3 and R_4 are independently selected from the group consisting of hydrogen and C_1 to C_{18} straight and branched chain acyclic, alicyclic, aryl, alkylaryl, arylalkyl radicals and functional derivatives thereof;

(b) mixing said polymeric hydroxyalkyl sulfonate with a metallic salt of a fatty acid having a lower K_a than an ionomer sulfonic acid groups, wherein said metallic salt is selected from the group consisting of antimony, hydroxyalkyl lead, aluminum and Groups I-A, I-B, II-A and II-B of the Periodic Table of Elements and mixtures thereof;

(c) heating the mixture of the polymeric hydroxyalkyl sulfonate and said metallic salt to a reaction temperature to form a mixture of anionomer and a hydroxyalkyl carboxylate ester, said ionomer being a metal neutralized sulfonated polymer and said hydroxyl carboxylate ester having the formula:



wherein said R, R_1, R_2, R_3, and R_4 are independently selected from the group consisting of hydrogen, C_1 to C_{18} straight and branched chain acyclic, alicyclic, aryl, alkylaryl, and arylalkyl groups and functional derivatives thereof and mixtures thereof; and

(d) recovering said mixture of said ionomer and said hydroxyalkyl carboxylate ester from said heated mixture.

4,131,587

PLASTICIZATION OF NEUTRALIZED SULFONATED ELASTOMERIC POLYMER

Douglas Brenner, Livingston, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Nov. 29, 1977, Ser. No. 855,547

Int. Cl.[2] C08K *5/18*

U.S. Cl. 260—32.6 A **9 Claims**

1. An elastomeric composition including:

(a) a neutralized sulfonated elastomeric polymer having about 15 to 60 meq metal sulfonate groups per 100 grams of said sulfonated elastomeric polymer; and

(b) at least about 10 parts by weight of an organic amine based on 100 parts of said neutralized sulfonated elasto-

meric polymer, wherein said amine is selected from the group consisting of mono and di-substituted amino naphthalene compounds, amino alkyl naphthalene compounds, and saturated n-alkyl amines and mixtures thereof, wherein the alkyl groups of said n-alkylamine has at least about 20 carbon atoms.

4,131,588

LOW VAPOR TRANSMISSION RATE SILICONE COMPOSITION

Alfred H. Smith, Jr., Jonesville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,061
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB **12 Claims**

1. A low vapor transmission rate room temperature vulcanizable silicone composition comprising (a) 100 parts by weight of a diorganopolysiloxane polymer having a viscosity varying from 100 to 500,000 centipoise at 25° C wherein said organo groups are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals; (b) from 75 to 150 parts by weight of a vapor barrier filler which is mica; (c) 0 to 30 parts by weight of a reinforcing or extending filler; (d) from 1 to 15 parts by weight of a cross-linking agent selected from the class consisting of $R_aSi(OR')_{4-a}$ and partial hydrolyzed products thereof where R and R' are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, a is 0 or 1 and a resinous copolymer of $R_3^2SiO_{0.5}$ units and SiO_2 units in a weight ratio of 0.5:1 to 1:1 when R^2 is selected from monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals and mixtures thereof; and (e) from 0.01 to 5 parts by weight of metal salt of a carboxylic acid as a catalyst where the metal varies from lead to manganese in the Periodic Table.

4,131,589

LOW TEMPERATURE TRANSMISSION ROOM TEMPERATURE VULCANIZABLE SILICONE COMPOSITIONS

Alfred H. Smith, Jr., Jonesville, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,062
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB **16 Claims**

1. A low vapor transmission rate room temperature vulcanizable silicone rubber composition comprising (a) 100 parts by weight of a silanol-terminated diorganopolysiloxane having a viscosity varying from 100 to 500,000 centipoise at 25° C where the organo groups are selected from the class consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals; (b) from 75 to 150 parts by weight of vapor barrier filler which is mica; (c) from 1 to 15 parts by weight of a silane and siloxane having functionality selected from the class consisting of alkoxy functionality, acyloxy functionality, amine functionality, amide functionality, ketoximino functionality, and tert-alkoxy functional silanes and (d) from 0.01 to 5 parts by weight of a catalyst.

4,131,590

EPOXY-RUBBER BASED FRICTION MATERIAL

Michael P. DeFrank, Crawfordsville, Ind., assignor to Raybestos-Manhattan, Inc., Trumbull, Conn.

Filed Aug. 18, 1977, Ser. No. 825,685
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—37 EP **9 Claims**

1. A friction material comprising a flexible solid binder matrix composed of a cured blend of epoxy resin and rubber, said material containing from about 5 to about 30 percent epoxy resin, from about 5 to about 30 percent rubber, and from about 60 to about 90 percent friction fillers comprising fibrous and powdered friction modifying materials, said friction material having a dynamic coefficient of friction in oil of from about 0.060 to about 0.150 and a static coefficient of friction in oil of from about 0.100 to about 0.300.

4,131,591

MINERAL-FILLED NYLON MOLDING COMPOSITIONS EXHIBITING LOW CREEP

Robert MacFarlane, Jr., Fanwood, N.J., assignor to Allied Chemical Corporation, Morristown, N.J.

Continuation-in-part of Ser. No. 717,851, Aug. 26, 1976, abandoned. This application Aug. 29, 1977, Ser. No. 828,356
Int. Cl.[2] C08L *77/02*
U.S. Cl. 260—37 N **40 Claims**

1. A polyamide molding composition comprising:
(a) polyamide resin;
(b) about 5 to 40 weight percent, based on the total weight of the composition, of substantially asbestos free talc in the form of platy fine particles having a surface area of at least about 7 m^2/g;
(c) about 2 to 40 weight percent, based on the total weight of the composition, of wollastonite; and
(d) about 5 to 25 weight percent, based on the total weight of the composition, of fiber glass; wherein the ingredients in the composition, are present in proportion to one another such that the composition after molding, has a creep slope of less than about 0.17 percent strain per log time.

4,131,592

FLAME RETARDANT RUBBER FLOORING COMPOSITION

Fred R. Davis, Kent, Ohio, assignor to The R.C.A. Rubber Company, Akron, Ohio

Continuation of Ser. No. 737,040, Oct. 29, 1976, abandoned. This application Mar. 20, 1978, Ser. No. 888,286
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23.7 R **6 Claims**

1. A flame retardant synthetic rubber composition for flooring material having a syntehtic rubber hot emulsion polymer combined with a high bound styrene resin, compounding agents, curing agents, and pigments, the improvement to the composition comprising,
the flame retardant materials of antimony oxide, a chlorinated paraffin hydrocarbon, hydrated alumina, asbestos and a high flash point naphthenic oil,
where about 6 to 10 parts of antimony oxide, about 25 to 40 parts of chlorinated paraffin hydrocarbon, about 150 to 450 parts of hydrated alumina, about 50 parts of asbestos, and about 10 to 40 parts of naphthenic oil are present per 100 parts of said rubber polymer for providing a flame spread index for the composition of less than or equal to 25.

4,131,593

LOW INFRARED EMISSIVITY PAINTS COMPRISING AN OXIME CURED SILICONE BINDER

Henry Y. B. Mar, Arden Hills, and Paul B. Zimmer, New Brighton, both of Minn., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 706,047, Jul. 19, 1976, abandoned. This application Oct. 13, 1977, Ser. No. 841,777
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB **2 Claims**

1. A low infrared emissivity coating composition particularly adapted to provide nuclear flash protection which comprises a mixture in equal amounts of (a) a pigment material selected from the group consisting of Ta_2O_5, $BaTiO_3$, CdS, Sb_2S_3. $CoTiO_3$, CdSe and mixtures thereof; and (b) an oxime cured silicone binder material.

4,131,594
FIRE-RESISTANT THERMOPLASTIC POLYESTER RESIN COMPOSITIONS AND PROCESS FOR RENDERING POLYESTERS FIRE-RESISTANT

Yoshitsugu Nakamura; Takeo Kawamura; Noritsugu Saiki, and Michiyuki Tokashiki, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed May 20, 1975, Ser. No. 579,064

Claims priority, application Japan, May 25, 1974, 49-58415; Jun. 3, 1974, 49-61784

Int. Cl.[2] C08L 67/06

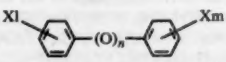
U.S. Cl. 260—40 R **8 Claims**

1. A fire-resistant thermoplastic polyester resin composition which consists essentially of

(A) an aromatic polyester resin selected from the group consisting of polyethylene terephthalate, polytrimethylene terephthalate, polytetramethylene terephthalate, polyhexamethylene terephthalate and mixtures thereof.

(B) a graft copolymer derived from a butadiene polymer having at least 50 mol% of butadiene units and a graft monomer selected from the group consisting of methacrylic acid esters, aromatic monovinyl compounds, vinyl cyanide compounds, and mixtures thereof present in an amount of at least 0.5 parts by weight but less than 25 parts by weight per 100 parts by weight of said polyester resin (A),

(C) a fire retardant selected from the group consisting of a compound of the formula



in which

X represents a halogen atom,

n respresents an integer of 1 or 0, and

l and m each represents an integer of 1–5, a halogen-substituted cyclopentadiene dimer; an oligomeric polycarbonate of tetrabromobisphenol A, and a combination thereof with antimony oxide, in an amount of from 0.5 to 35 parts by weight per 100 parts by weight of said polyester resin (A),

(D) a glass fiber present in an amount less than 120 parts by weight per 100 parts by weight of said polyester resin (A), and

(E) at least one additive, in an amount of 0 to 10 parts by weight per 100 parts by weight of said polyester resin (A), selected from the group consisting of stabilizers, coloring agents, mold releasing agents, nucleating agents, lubricants, and inorganic fillers other than said glass fiber.

4,131,595
THERMOPLASTIC MOULDING COMPOSITIONS

Franz Breitenfellner and Holger Andreas, both of Bensheim, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 16, 1977, Ser. No. 769,357

Claims priority, application Switzerland, Feb. 26, 1976, 2399/76

Int. Cl.[2] C08K 3/40

U.S. Cl. 260—40 R **15 Claims**

1. A moulding compound based on polyester mixtures consisting of a polyalkylene terephthalate and a further thermoplastic polyester, said moulding compound containing

a. 95 to 60% by weight, referred to the polyester mixture, of poly(1,4-butylene terephthalate), and

b. 5 to 40% by weight of a copolyester of terephthalic acid, 1,4-butanediol and aliphatic dicarboxylic acid of the formula I

HOOC—R—COOH (I)

wherein R represents a divalent aliphatic hydrocarbon group having not more than 34 carbon atoms

and wherein the acid of formula I is from 5 to 30 molar percent of the copolyester.

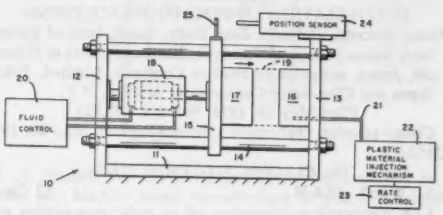
4,131,596
SENSING SYSTEM AND METHOD FOR PLASTIC INJECTION MOLDING

Paul E. Allen, Newtown, Conn., assignor to Logic Devices, Inc., Sandy Hook, Conn.

Filed Aug. 22, 1977, Ser. No. 826,494

Int. Cl.[2] B29F 1/06

U.S. Cl. 264—40.5 **5 Claims**



1. The method of providing a control signal in an injection molding cycle for influencing an operation in the cycle comprising the steps of urging a pair of mold dies to a closed position by either a higher or a lower closing force, injecting plastic material under pressure into the closed mold dies while the dies are urged closed by the higher closing force, measuring the extent of the separation of the mold dies caused by the plastic material injection, determining the extent of separation of the dies that enables plastic material to flow between the separated mold dies to form flash, shifting from the higher to the lower closing force if the determined extent of separation is achieved and holding said lower closing force for the remainder of the cycle that the mold dies have a closing force exerted thereon to thereby reduce flash causing deterioration of the mold dies.

4,131,597
BIOACTIVE COMPOSITE MATERIAL PROCESS OF PRODUCING AND METHOD OF USING SAME

Waldemar Blüethgen, Braunsfels; Heinz Bröemer, Hermannstein, and Klaus K. Deutscher, Wetzlar, all of Germany, assignors to Ernst Leitz GmbH, Wetzlar, Germany

Filed Jan. 12, 1976, Ser. No. 648,505

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1975, 2501683

Int. Cl.[2] C08K 7/14

U.S. Cl. 260—42.18 **23 Claims**

1. A composite material for prosthetic purposes, said material consisting of a polymerizable plastic matrix and between about 10 and about 70% by volume of inorganic bioactive and biocompatible material.

2. The composite material of claim 1, in which the bioactive material is a bioactive glass ceramic material having an apatite crystal phase and being of the following composition, in weight percent:

between about 20.0% and about 60.0% of silicon dioxide SiO_2,
between about 5.0% and about 40.0% of phosphorus pentoxide P_2O_5,
between about 2.7% and about 20.0% of sodium oxide Na_2O,
between about 0.4% and about 20.0% of potassium oxide K_2O,
between about 2.0% and about 30.0% of magnesium oxide MgO, and
between about 5.0% and about 40.0% of calcium oxide CaO.

4,131,598

POLYPHENYLENE ETHER COMPOSITION

Visvaldis Abolins, Delmar, and Gim F. Lee, Jr., Albany, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Mar. 29, 1976, Ser. No. 671,341
Int. Cl.[2] C08K 7/14; C08L 71/04
U.S. Cl. 260—42.18 29 Claims

1. A thermoplastic composition comprising:
(a) a polyphenylene ether resin; and
(b) a copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride.

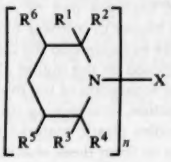
4,131,599

STABILIZATION OF POLY(MONO-OLEFINS)

Heimo Brunetti, Reinach; Jean Rody, Basel, both of Switzerland; Nobuo Soma, and Tomoyuki Kurumada, both of Hiromachi, Japan, assignors to Sankyo Company, Limited, Tokyo, Japan and Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 19, 1976, Ser. No. 687,823
Claims priority, application United Kingdom, May 28, 1975, 23352/75
Int. Cl.[2] C08K 5/34; C07D 211/06
U.S. Cl. 260—45.8 N 12 Claims

5. A composition consisting of an polymono-olefins normally subject to ultraviolet deterioration and 0.01 to 5% by weight of a stabilizer of formula I



wherein
R^1 is alkyl having 2–6 C-atoms,
R^2 is alkyl having 1–6 C-atoms,
R^3 is alkyl having 1–9 C-atoms, phenyl, benzyl or phenylethyl,
R^4 is alkyl having 1–6 C-atoms or
R^3 and R^4 together with the C-atom to which they are attached represent a cyclopentyl or cyclohexyl group,
R^5 is alkyl having 1–5 C-atoms, alkenyl or alkinyl having 3–4 C-atoms or aralkyl having 7–8 C-atoms,
R^6 is hydrogen, alkyl having 1–5 C-atoms, alkenyl or alkinyl having 3–4 C-atoms, aralkyl having 7–8 C-atoms, and R^5 and R^6 are interchangeable,
n is 1 or 2, and if n is 1,
X is hydrogen, the oxyl radical, alkyl having 1–8 C-atoms, alkenyl having 3–6 C-atoms, alkinyl having 3 or 4 C-atoms, alkoxyalkyl having 2–21 C-atoms, aralkyl having 7–8 C-atoms, the 2,3-epoxypropyl group, an aliphatic acyl group having 1–12 C-atoms, or one of the groups $—CH_2COOR^7$, $—CH_2—CH(R^8)—OR^9$ or $—COOR^{10}$ wherein
R^7 is alkyl having 1–12 C-atoms, alkenyl having 3–6 C-atoms, phenyl, aralkyl having 7–8 C-atoms or cyclohexyl,
R^8 is H, CH_3 or phenyl,
R^9 is H or an aliphatic, aromatic, alicyclic or araliphatic acyl group having up to 18 C-atoms, which may optionally be substituted in its aryl moiety with chlorine, alkyl having 1–4 C-atoms, alkoxy having 1–8 C-atoms or hydroxy and combinations thereof, and
R^{10} is alkyl having 1–12 C-atoms, benzyl, cyclohexyl or phenyl and if n is 2,
X is alkylene having 4–8 C-atoms, 2-butenylene-1,4, a group $—CH_2CH(R^8)—O—R^{11}—O—CH(R^8)—CH_2—$ wherein R^{11} is an aliphatic or aromatic diacyl group having up to 12 C-atoms or X is a group $—CH_2—COO—R^{12}—OOC—CH_2—$, wherein R^{12} is alkylene having 2-8 C-atoms or xylylene or a mixture of isomers thereof or an acid addition salt thereof.

4,131,600

HOT-HARDENING REACTION RESIN MIXTURE FOR IMPREGNATING THE INSULATION OF ELECTRICAL EQUIPMENT AND FOR THE MANUFACTURE OF MOLDED MATERIALS WITH OR WITHOUT INSERTS

Walter Ihlein, Berlin; Wolfgang Kleeberg, Erlangen; Helmuth Markert, Nuremberg, and Willi Mertens, Berlin, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Dec. 1, 1977, Ser. No. 856,490
Claims priority, application Fed. Rep. of Germany, Dec. 3, 1976, 2655367
Int. Cl.[2] C08G 18/18, 59/18
U.S. Cl. 528—53 9 Claims

1. In a heat curing resin mixture, said mixture for impregnating the insulation of electrical equipment formed of sleeves made of insulating materials in foil or tape form with a heat resistance which corresponds to at least Class H of electrical conductors, particularly of winding bars or coils of electric machines, and for manufacturing molded materials with or without inserts, including a mixture of purified polyisocyanate and polyepoxy resin compounds which contain an accelerator system (catalyst), the improvement comprising:
said accelerator system being formed by addition complexes of tertiary amines and boron trichloride of the general formula $BCl_3 \cdot NR_1R_2R_3$, where in R_1, R_2 and R_3 are like or different aliphatic, aromatic, heterocyclic or aryl-aliphatic radicals and wherein R_1, R_2 and R_3 belong to heterocyclic rings jointly or in pairs.

4,131,601

PROCESS FOR THE PREPARATION OF POLYESTERS

Satoshi Hashimoto, Matsuyama; Nobuya Okumura, Ehime, and Kiyoshi Kazama, Matsuyama, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 4, 1977, Ser. No. 839,464
Claims priority, application Japan, Oct. 5, 1976, 51-119007
Int. Cl.[2] C08G 63/14
U.S. Cl. 528—279 5 Claims

1. In a process for the preparation of substantially linear, highly polymerized polyesters by polycondensing a glycol ester of an aromatic dicarboxylic acid and/or a low molecular weight condensate thereof while removing glycol therefrom in the presence of a polycondensation catalyst, the improvement which comprises using as the polycondensation catalyst a preformed titanate compound obtained by reacting a titanic acid ester represented by the formula $Ti(OR)_4$, where R is an alkyl group having from 1 to 5 carbon atoms, with an aromatic acid selected from the group consisting of trimellitic acid, trimellitic anhydride, hemimellitic acid, hemimellitic anhydride or a mixture of one or more thereof at a molar ratio of from about 0.5 to about 2.5 mols of the aromatic acid per 1 mol of the titanic acid ester.

4,131,602

RADIATION CURABLE ACRYLATED POLYURETHANE

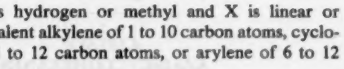
Leonard E. Hodakowski, St. Albans, and Charles H. Carder, Amma, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 29, 1977, Ser. No. 837,974
Int. Cl.[2] C08G 18/67, 18/42, 18/12
U.S. Cl. 528—49 11 Claims

1. An acrylated or methacrylated polyurethane produced by the process which comprises the steps of:
(A) producing an isocyanate-terminated urethane intermediate by reacting
(i) an organic diisocyanate;
(ii) an organic tri/tetraol chosen from the group consisting of polyester tri/tetraols and polyether tri/tetraols; and

(iii) an organic diol chosen from the group consisting of polyester diols and polyether diols, said organic diisocyanate being employed in equivalent excess to said organic tri/tetraol and organic diol; the ratio of organic diol to organic tri/tetraol employed being from about 1:1 to about 7:1; and provided that when the organic tri/tetraol is a polyester tri/tetraol the organic diol is a polyether diol, and when the organic tri/tetraol is a polyether tri/tetraol the organic diol is polyester diol; then

(B) reacting the isocyanate-terminated urethane produced in step (A) with a sufficient amount of an hydroxyacrylate or hydroxymethacrylate to react at least 80% of the isocyanate groups of the intermediate, said hydroxyacrylate or hydroxymethacrylate having the formula



wherein Z is hydrogen or methyl and X is linear or branched divalent alkylene of 1 to 10 carbon atoms, cycloalkylene of 5 to 12 carbon atoms, or arylene of 6 to 12 carbon atoms.

4,131,603

HEAT SENSITIZING MIXTURE COMPRISING AN AMIDE AND A HEAT SENSITIZING AGENT WHICH IS A POLY(ALKYLENE OXIDE) CONTAINING URETHANE GROUPS

Hermann Perrey, Krefeld; Martin Matner, Odenthal, and Gustav Sinn, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen-Bayerwerk, Germany

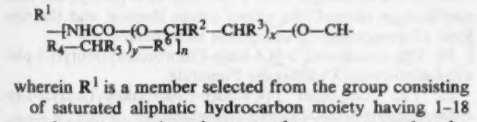
Division of Ser. No. 676,486, Apr. 13, 1976. This application Nov. 28, 1977, Ser. No. 855,225

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1975, 2516979

Int. Cl.[2] C08G *18/30*

U.S. Cl. 528—45 **3 Claims**

1. A heat sensitizing mixture comprising (a) a water-soluble amide of an acid selected from the group consisting of carbonic acid, thiocarbonic acid, carboxylic acid and thiocarboxylic acid which amide may be unsubstituted at the nitrogen atom or substituted with at least one alkyl having 1–4 carbon atoms; (b) a member selected from the group consisting of boric acid and an oxalkylated polysiloxane; and (c) a heat sensitizing agent of the formula



wherein R^1 is a member selected from the group consisting of saturated aliphatic hydrocarbon moiety having 1–18 carbon atoms and a valency equal to n, a saturated cycloaliphatic hydrocarbon having 5 to 6 carbon atoms and a valency equal to n, an aromatic hydrocarbon radical having 6–10 carbon atoms and a valency equal to n, said cycloaliphatic radical substituted by chlorine or alkyl having 1–4 carbon atoms and said aromatic radical substituted by chlorine or alkyl having 1–4 carbon atoms;

n is a number from 1 to 20;

R^2, R^3, R^4 and R^5 are independently of one another members selected from the group consisting of hydrogen, alkyl having 1–4 carbon atoms, chloromethyl and phenyl;

x is a numer from 1 to 100;

y is a number from 0 to 50; and

R^6 is a member selected from the group consistin of aryloxy, aralkoxy, alkaryloxy, alkanoyloxy, aroyloxy, alkylamidok, alkylsulfonamido and alkoxy.

4,131,604

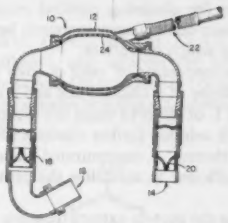
POLYURETHANE ELASTOMER FOR HEART ASSIST DEVICES

Michael Szycher, Peabody, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Nov. 23, 1977, Ser. No. 854,274

Int. Cl.[2] C08G *18/48*

U.S. Cl. 528—79 **22 Claims**



1. A bladder for devices intended for implantation in a human said bladder being characterized in that it is formed from an aliphatic polyurethane elastomer said polyurethane elastomer being the reaction product of:

(1) dicyclohexyl methane diisocyanate;

(2) poly tetra methylene ether glycol having a molecular weight between the range of 500–5,000;

(3) a low molecular weight glycol selected from the group consisting of propylene glycol, dipropylene glycol ethylene glycol, diethylene glycol, neopentyl glycol and cyclohexane dimethanol, and

(4) a trihydric alcohol crosslinker, said trihydric alcohol being selected from the group consisting of glycerol, pentaerythritol, trimethylolethane, trimethylolpropane, and mannitol said polyurethane elastomer having a molecular weight within the range of 80–120 thousand molecular weight units.

4,131,605

POLY(ETHER)URETHANE CURABLE AT AMBIENT TEMPERATURE USING BUTYLSTANNOIC ACID CATALYST

Vernon G. Ammons, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1978, Ser. No. 866,437

Int. Cl.[2] C08G *18/24*

U.S. Cl. 528—77 **15 Claims**

1. An ambient temperature curable polyurethane composition prepared by the reaction of:

a. an aliphatic diisocyanate;

b. a polyalkylene ether glycol;

c. a compound comprising three hydroxyl groups capable of reacting with isocyanato groups; and

d. butyl stannoic acid catalyst.

4,131,606

POLY(LACTONE)URETHANE CURABLE AT [CASTABLE] AMBIENT TEMPERATURE [CURABLE POLYURETHANE INTERLAYER] USING BUTYLSTANNOIC ACID CATALYST

Vernon G. Ammons, Glenshaw, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 3, 1978, Ser. No. 866,438

Int. Cl.[2] C08G *18/24*

U.S. Cl. 528—58 **12 Claims**

1. A polyurethane composition curable at ambient temperatures prepared by the reaction of:

a. an aliphatic diisocyanate;

b. a polylactone polyol comprising polylactone triol; and

c. butyl stannoic acid catalyst.

4,131,607
PROCESS FOR OBTAINING PURIFIED PROTEIN ISOLATES

Léon Petit, Sceaux; André Davin, La Chapelle sur Erdre, and Jacques Guéguen, Cachan, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Oct. 23, 1975, Ser. No. 625,036
Claims priority, application France, Oct. 23, 1974, 74 35594
Int. Cl.[2] A23J *1/14*
U.S. Cl. 260—123.5 26 Claims

1. A process for obtaining purified protein isolates from protein substances containing compounds having a mucilaginous consistency which comprises:

(a) making a suspension of cake of such protein substance with a solution of a calcium salt and a magnesium salt of volume in 1. of 10 to 15 times the weight in Kg. of press cake which solution further contains sodium sulphite,

(b) adding thereto a concentrated solution of alkali in amount sufficient to solubilize the proteins in said press cake,

(c) separating the protein extract from the insoluble residue,

(d) acidifying the protein extract obtained with an acid solution at a pH between 4.5 and 5.5 to precipitate the proteins,

(e) separating the protein precipitate from the mother liquor,

(f) washing the protein precipitate and recovering the protein isolate.

4,131,608
THIOETHERS

Ludwig Zirngibl, Zofingen; Johanna Fischer, Reiden, and Kurt Thiele, Zofingen, all of Switzerland, assignors to Siegfried Aktiengesellschaft, Zofingen, Switzerland

Filed May 9, 1977, Ser. No. 795,224
Claims priority, application Switzerland, May 12, 1976, 5930/76
Int. Cl.[2] C07D *263/58*
U.S. Cl. 260—307 D 1 Claim

1. 1-[β-(2-benzoxazolylthio)-2,4-dichlorophenethyl]-imidazole and the acid addition salts thereof.

4,131,609
SILICON-PHTHALOCYANINE-SILOXY MONOMERS

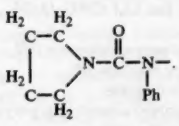
Kenneth J. Wynne, Falls Church, Va., and John B. Davison, Amherst, N.Y., assignors to The United States of America as represented by the Secretary of the Navy

Filed Feb. 23, 1978, Ser. No. 880,515
Int. Cl.[2] C09B *47/04*
U.S. Cl. 260—314.5 6 Claims

1. A silicon-phthalocyanine-siloxy monomer having the formula:

$$PcSi(OSiR'Ph(OSiR_2'')_rX)_2$$

wherein R′ and R″ are alkyl groups having from 1 to 8 carbon atoms, r is an integer from 1 to 4, and x is a hydroxyl group or an ureido group having the formula:

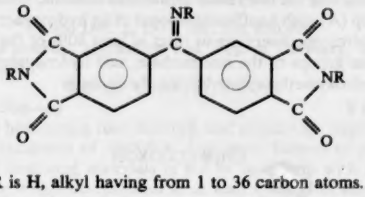


4,131,610
IMINODIIMIDES OF 3,3′,4,4′-BENZOPHENONETETRACARBOXYLIC DIANHYDRIDE AND COMPOSITIONS THEREOF

Costandi A. Audeh, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 29, 1977, Ser. No. 828,379
Int. Cl.[2] C07D *403/06;* C10M *1/32, 1/36*
U.S. Cl. 260—326 N 3 Claims

1. A compound having the following general structure:



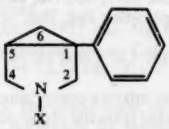
where R is H, alkyl having from 1 to 36 carbon atoms.

4,131,611
AZABICYCLOHEXANES

William J. Fanshawe, Pearl River; Joseph W. Epstein, Monroe; Lantz S. Crawley, Spring Valley, all of N.Y.; Corris M. Hofmann, Ho-Ho-Kus, and Sidney R. Safir, River Edge, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 723,402, Sep. 15, 1976, abandoned, which is a continuation-in-part of Ser. No. 601,128, Jul. 31, 1975, abandoned. This application Jun. 23, 1977, Ser. No. 809,339
Int. Cl.[2] A01N *31/40;* C07D *209/52*
U.S. Cl. 260—326.8 69 Claims

1. An optically active compound of the formula:



wherein the phenyl moiety is unsubstituted or mono- or di-substituted from the group consisting of halogen, straight chain and mono-branched C_1–C_6 alkyl, trifluoromethyl, and nitro; X is selected from the group consisting of hydrogen, straight chain C_1–C_8 alkyl, and a moiety of the formula $C_nH_{2n}R_1$, wherein n is an integer from 1 to 3 and R_1 is phenyl; the racemic mixture thereof; the mirror image thereof; and the non-toxic pharmaceutically acceptable salts thereof.

34. The compound 3-[4,4-bis(p-Fluorophenyl)butyl]-1-phenyl-3-azabicyclo[3.1.0]hexane Fumarate.

35. The compound 3-[4,4-bis(p-Fluorophenyl)butyl]-1-(p-chlorophenyl)-3-azabicyclo[3.1.0]hexane.

4,131,612
PROCESS FOR PURIFYING CRUDE DIBENZYLIDENE SORBITOL

Hiroshi Uchiyama, Hirakata, Japan, assignor to E. C. Chemical Ind. Co., Ltd. and C. Itoh & Co., both of, Japan

Filed May 9, 1977, Ser. No. 795,185
Claims priority, application Japan, Jul. 1, 1976, 51-77128
Int. Cl.[2] C07D *319/04, 317/10*
U.S. Cl. 260—340.7 2 Claims

1. A process for purifying crude dibenzylidene sorbitol, which comprises mixing 1 part by weight of crude dibenzylidene sorbitol obtained by reacting 1 mole of d-sorbitol with 2 moles of benzaldehyde and containing not more than about 7% by weight of by-product monobenzylidene sorbitol, tribenzylidene sorbitol, or both as impurities, with 5 to 15 parts by

weight of at least one lower aliphatic alcohol at a temperature of at least 50° C. but below the boiling point of the lower aliphatic alcohol, thereby to dissolve the impurities in the aliphatic alcohol, and then separating and recovering the purified dibenzylidene sorbitol from the resulting solution.

4,131,613

ISOIMIDYL-PHTHALIC ANHYDRIDES

Vratislav Kvita, Muttenz; Roland Darms, Therwil, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

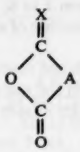
Division of Ser. No. 531,030, Dec. 9, 1974, Pat. No. 3,979,393. This application Jul. 22, 1976, Ser. No. 707,923

Claims priority, application Switzerland, Dec. 20, 1973, 017903/73

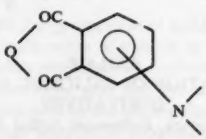
Int. Cl.[2] C07D *307/90, 307/66*

U.S. Cl. 260—343.3 R **1 Claim**

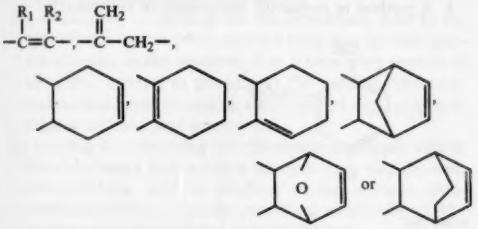
1. An isoimidyl-phthalic anhydride of the formula



wherein X represents the divalent radical



and A represents a divalent radical selected from the group consisting of



where R_1 and R_2 independently of one another denote hydrogen, chlorine, bromine or methyl.

4,131,614

PROCESS FOR PREPARING CIS-HEXAHYDRODIBENZOPYRANONES

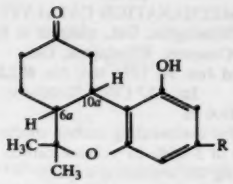
Charles W. Ryan, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 702,806, Jul. 6, 1976, abandoned. This application Sep. 8, 1977, Ser. No. 831,458

Int. Cl.[2] C07D *311/78*

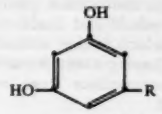
U.S. Cl. 260—345.3 **9 Claims**

1. In a process for preparing a cis-hexahydrodibenzopyranone of the formula

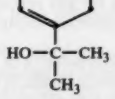


wherein:

R is C_5–C_{10} alkyl, C_5–C_{10} alkenyl, C_5–C_8 cycloalkyl or C_5–C_8 cycloalkenyl, and wherein the hydrogen atoms attached at the 6a and 10a positions are oriented cis to one another, which includes reacting a 5-substituted resorcinol of the formula



wherein R has the above-defined meaning, with a 1-alkoxy-4-(1-hydroxy-1-methylethyl)-1,4-cyclohexadiene of the formula



wherein R_2 is C_1–C_4 alkyl, in the presence of a catalyst selected from boron tribromide, boron trifluoride, and stannic chloride, in an unreactive organic solvent, the improvement comprising adding about an equimolar quantity of water to the reaction mixture.

4,131,615

FURAN DERIVATIVE FOR USE AS PHARMACEUTICAL PRODUCT PARTICULARLY FOR THE TREATMENT OF RHEUMATIC ILLNESSES

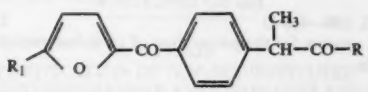
Giorgio D'Alò, Milan, Italy, assignor to A. Wasserman S.p.A., Milan, Italy

Filed Aug. 8, 1977, Ser. No. 822,863

Int. Cl.[2] C07D *307/54*

U.S. Cl. 260—347.3 **3 Claims**

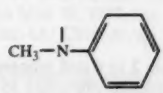
1. A derivate of 4-(furan-2-carbonyl) phenylacetic acid having formula



in which:

R_1 is a hydrogen or bromine atom,

R is —OH, —OCH_3, or



4,131,616
METHANATION CATALYST

Alvin B. Stiles, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 24, 1974, Ser. No. 482,574
Int. Cl.[2] C07C *27/06*
U.S. Cl. 260—449.6 M 2 Claims

1. A process for methanating carbon oxides contained in a gaseous mixture of 3–25% by volume carbon oxides and hydrogen comprising the sequential steps of

a. contacting the mixture with a first stage methanation catalyst at a temperature between the threshold and deactivation temperatures of the catalyst by which a partially methanated reaction product is produced having a temperature of 600–900° C.;
b. cooling the first stage reaction product to 250–450° C.;
c. contacting the cooled first stage reaction product containing a reduced amount of carbon oxides with at least one intermediate stage methanation catalyst at a temperature between the threshold and deactivation temperature of the catalyst by which further methanated reaction product is produced having a temperature of 450–750° C.;
d. cooling the intermediate stage reaction product to 200–400° C.; and
e. contacting the cooled intermediate stage reaction product containing a further reduced amount of carbon oxides with a final stage methanation catalyst at a temperature between the threshold and deactivation temperatures of the catalyst by which an essentially carbon oxide-free reaction product is produced having a temperature of 375–600° C. the process being further characterized in that the temperature of the reaction product from any catalyst stage is higher than for any succeeding stage and at least the final stage methanation catalyst was prepared by the steps

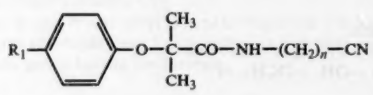
(1) preparing an aqueous solution of compounds of the metals nickel and chromium in which solution the mol ratio of nickel to chromium is from about 0.5 to about 5.0;
(2) adjusting the pH of the aqueous so ution by which the metals are coprecipitated and separated from solution in finely divided solid form;
(3) calcining and particulating the coprecipitated solids by which they are converted to an incipient crystalline compound containing a minor amount of hexavalent chromium ions; and
(4) reducing the hexavalent chromium contained in the incipient crystalline compound to trivalent form while maintaining the nickel in an unreduced oxide form.

4,131,617
PREPARATION OF NEW ISOBUTYLRAMIDE DERIVATIVES

André Esanu, Paris, France, assignor to Societe d'Etudes de Produits Chimiques, Paris, France

Filed Mar. 17, 1977, Ser. No. 778,724
Claims priority, application United Kingdom, Mar. 17, 1976, 10634/76
Int. Cl.[2] C07C *121/78*
U.S. Cl. 260—465 D 2 Claims

1. A process for the preparation of an isobutyramide of the formula

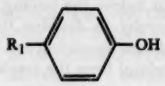


wherein:

R_1 is a halogen; and

n is an integer from 2 to 6 said process comprising:

(a) forming a sodium phenolate by reacting in ethanol sodium with a phenol of the formula

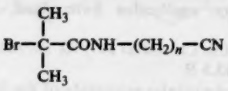


wherein R_1 is a halogen;

(b) adding an excess of toluene to the ethanol solution of sodium phenolate of step (a) whereby an ethanol/toluene azeotrope is formed;

(c) removing the azeotrope of step (b) by distillation;

(d) forming a reaction mixture by adding to the solution of sodium phenolate in toluene remaining from step (c) an N-cyanoalkyl α -bromo-isobutyramide of the formula:



wherein n is an integer from 2 to 6;

(e) refluxing the reaction mixture of step (d) for a period of from 6 to 15 hours;

(f) adding water to the refluxed reaction mixture whereby a precipitate is formed in the reaction mixture; and

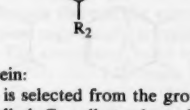
(g) separating the precipitate of step (f) from the reaction mixture.

4,131,618
PREPARATION OF SALICYLIC ACID AND DERIVATIVES

Leonard M. Weinstock, Bellemead; Arthur S. Wildman, Martinsville, and Dennis M. Mulvey, Milford, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 29, 1977, Ser. No. 865,563
Int. Cl.[2] C07C *65/14*
U.S. Cl. 562—469 12 Claims

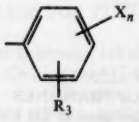
1. A method of preparing compounds of the formula:



wherein:

R_1 is selected from the group consisting of hydrogen, C_{1-4} alkyl, C_{1-4} alkoxy, benzyl, C_{1-4} alkenyl and halo; and

R_2 is hydrogen or

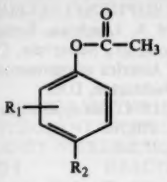


where n is 1 to 5,

X is halogen, and

R_3 is selected from the group consisting of C_{1-4} alkyl and C_{1-4} alkoxy;

comprising the step of fusing a starting material selected from compounds of the formula:



wherein R_1 and R_2 are as defined above; with a substantially anhydrous compound of the formula:

$$M_2CO_3$$

where M is potassium or sodium; under substantially anhydrous conditions and in the presence of carbon dioxide, at a pressure of from atmospheric to 500 p.s.i.g., and at a temperature of from 150° to 250° C.

4,131,619

PREPARATION OF 2-CHLORO-4-TOLUENESULFONYL CHLORIDE

R. Garth Pews, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 22, 1978, Ser. No. 888,887

Int. Cl.[2] C07C *143/28, 143/40*

U.S. Cl. 260—543 R **4 Claims**

1. In a process for the preparation of 2-chloro-4-toluenesulfonyl chloride by sulfonation of toluene to form toluenesulfonic acid, the nuclear chlorination of toluenesulfonic acid to form chlorotoluenesulfonic acid and the conversion of the chlorotoluenesulfonic acid to the chlorotoluenesulfonyl chloride, the improvement wherein the process comprises the steps of:

(a) reacting by contacting toluene with sulfur trioxide in an anhydrous, chlorinated hydrocarbon medium to produce in the medium toluenesulfonic acid consisting essentially of the 4-toluenesulfonic acid isomer;

(b) reacting by contacting the toluenesulfonic acid in the chlorinated hydrocarbon medium from step (a) with gaseous chlorine in the presence of an accelerating amount of an iodine catalyst to produce in the medium chlorotoluenesulfonic acid consisting essentially of the 2-chloro-4-toluene sulfonic acid isomer; and

(c) reacting by contacting the chlorotoluenesulfonic acid in the chlorinated hydrocarbon medium from step (b) with chlorosulfonic acid to produce in the medium chlorotoluenesulfonyl chloride consisting essentially of the 2-chloro-4-toluenesulfonyl chloride isomer.

4,131,620

SULFAMIC ACID HALIDES AND THEIR MANUFACTURE

Gerhard Hamprecht, Mannheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

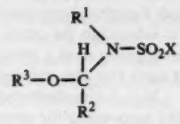
Filed Jun. 16, 1977, Ser. No. 807,064

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1976, 2634485

Int. Cl.[2] C07C *155/00, 51/58, 161/00*

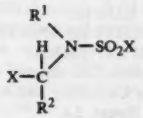
U.S. Cl. 260—543 R **9 Claims**

1. A process for the manufacture of sulfamic acid halides of the formula



I

where R^1 is an aliphatic or cycloaliphatic radical, R^2 is hydrogen or an aliphatic radical, R^3 is an aliphatic, cycloaliphatic or araliphatic radical and X is halogen, which comprises: reacting N-(α-haloalkyl)sulfamic acid halides of the formula



II

where R^1, R^2 and X have the above meanings, with an alcohol of the formula

$$R^3—OH \qquad \text{III}$$

where R^3 has the above meanings.

4,131,621

ADDUCTS OF CARBAMOYL SULPHOXIDES

Franco Gozzo, S. Donato Milanese, (Milan); Marcella Masoero, Milan; Ernesto Signorini, Malnate (Varese), and Riccardo Fabbrini, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Continuation of Ser. No. 608,976, Aug. 29, 1976, Pat. No. 4,008,071, which is a continuation-in-part of Ser. No. 584,352, Jun. 6, 1975, Pat. No. 3,975,180. This application Sep. 3, 1976, Ser. No. 720,215

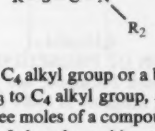
Claims priority, application Italy, Jun. 7, 1974, 23725 A/74; Sep. 3, 1974, 26861 A/74

Int. Cl.[2] A01N *9/14;* C07C *125/08*

U.S. Cl. 260—551 C **6 Claims**

1. An adduct of

(a) one or two moles of a carbamoyl sulphoxide of the formula:



wherein R is a C_1 to C_4 alkyl group or a benzyl group, and R_1 and R_2 are each a C_3 to C_4 alkyl group, and

(b) one, two or three moles of a compound selected from the class consisting of phenylurea, biuret, thiourea, dicyanodiamide and dichloralurea.

4,131,622

PURIFICATION OF N,N'-DISUBSTITUTED p-PHENYLENEDIAMINE ANTIOZONANTS AND OIL STABILIZERS

Ivan C. Popoff, Ambler, and Paul G. Haines, Lafayette Hill, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 343,778, Mar. 22, 1973, abandoned. This application May 18, 1977, Ser. No. 798,186

Int. Cl.[2] C07C *85/26*

U.S. Cl. 260—576 **3 Claims**

1. A process for purifying soft, mushy, crude N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine prepared by reductive alkylation of N-phenyl-p-phenylenediamine with an excess

of a 4-methyl-2-pentanone, and stripping off water, excess 4-methyl-2-pentanone and 4-methyl-2-pentanol; wherein the purification consists of (a) subjecting the crude reaction product to superheated steam stripping until a portion of the reaction product is removed such that the stripped residue comprises flakable N-(1,3-dimethylbutyl)-N'-phenyl-p-phenylenediamine, and (b) recovering the stripped residue as the final product.

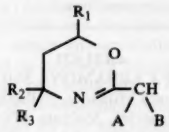
4,131,623

SYNTHESIS OF ALDEHYDES AND PRODUCTS OF SUCH SYNTHESIS

Albert I. Meyers, New Orleans, La., assignor to Board of Supervisors of Louisiana State University and Agricultural & Mechanical College, Baton Rouge, La.

Filed Jul. 8, 1969, Ser. No. 840,062
Int. Cl.[2] C07C *47/02*
U.S. Cl. 260—601 R **8 Claims**

1. A process of making aldehydes which comprises reacting a dihydro-1,3-oxazine of the formula



in which R_1, R_2 and R_3 are individually selected from the group consisting of hydrogen, methyl, ethyl and propyl and in which A and B are individually selected from the group consisting of hydrogen, phenyl, cyano, methoxy and carboalkoxy with an alkali metal-alkyl compound below 50° C. to produce an oxazine anion, reacting the anion with an electrophile below −50° C. in an anhydrous organic solvent to produce a dihydrooxazine, treating the dihydrooxazine with an alkali metal borohydride solution at about neutral pH and at subzero temperature to obtain a tetrahydrooxazine, converting the tetrahydrooxazine to the aldehyde by steam distillation or hydrolysis and recovering the aldehyde thus produced.

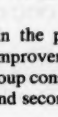
4,131,624

REDUCTION OF PHOSPHINE OXIDES

William R. Davis, South Plainfield, and Michael D. Gordon, Clark, both of N.J., assignors to M&T Chemicals Inc., Stamford, Conn.

Filed Jul. 5, 1977, Ser. No. 812,761
Int. Cl.[2] C07F *9/50*
U.S. Cl. 260—606.5 P **8 Claims**

1. In an improved method for converting a tertiary phosphine oxide to the corresponding tertiary phosphine by reacting the phosphine oxide with a silicon compound containing the structure



wherein X is halogen, in the presence of a stoichiometric amount of an amine, the improvement which consists of selecting the amine from the group consisting of monofunctional and polyfunctional primary and secondary amines.

4,131,625

4,4'-BIS(3-ETHYNYLPHENOXY)DIPHENYLSULFONE

Fred E. Arnold, Centerville; Gerard A. Loughran, Kettering, both of Ohio, and Anthony Wereta, Jr., Sunnyvale, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 736,287, Oct. 28, 1976. This application Jan. 19, 1978, Ser. No. 870,706
Int. Cl.[2] C07C *147/06*
U.S. Cl. 260—607 AR **1 Claim**

1. 4,4'-Bis(3-ethynylphenoxy)diphenylsulfone.

4,131,626

PROCESS FOR PRODUCING BROMINE

Lakshmi P. Sharma, Manlius, and Bruce E. Kurtz, Marcellus, both of N.Y., assignors to Allied Chemical Corporation, Morris Township, County of Morris, N.J.

Filed Dec. 21, 1976, Ser. No. 753,169
Int. Cl.[2] C07C *17/00*
U.S. Cl. 260—658 R **22 Claims**

1. A process for producing bromine from bromide salts which comprises heating a solid bromide salt at a temperature of about 500° to 1000° C in the presence of an oxygen-containing gas, silicon dioxide and an oxidation catalyst comprising a mixture of B_2O_3 and CaO.

4,131,627

CONTINUOUS HYDROGENATION OF CYCLOPENTADIENE TO CYCLOPENTENE USING A RANEY NICKEL CATALYST SATURATED WITH AMMONIA

Lawson G. Wideman, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 11, 1977, Ser. No. 850,578
Int. Cl.[2] C07C *5/02*
U.S. Cl. 260—666 A **2 Claims**

1. A process for the preparation of cyclopentene which comprises selectively hydrogenating cyclopentadiene in a liquid phase by continuously passing a mixture of cyclopentadiene and hydrogen through a fixed bed catalyst comprising a highly dispersed form of nickel selected from the group comprising Raney nickel or modified Raney nickel which has been treated or saturated with ammonia or ammonium hydroxide.

4,131,628

HYDROCARBON DEHYDROGENATION USING NONACIDIC MULTIMETALLIC CATALYST

George J. Antos, Arlington Heights; John C. Hayes, Palatine, and Ernest L. Pollitzer, Skokie, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 771,127, Feb. 22, 1977, Pat. No. 4,085,154, which is a continuation-in-part of Ser. No. 681,007, May 18, 1976, Pat. No. 4,013,735, which is a continuation-in-part of Ser. No. 564,386, Apr. 2, 1975, Pat. No. 3,960,711. This application Jan. 6, 1978, Ser. No. 867,639
Int. Cl.[2] C07C *5/40, 15/04, 11/00*
U.S. Cl. 260—666 A **8 Claims**

1. A method for dehydrogenating a dehydrogenatable hydrocarbon comprising contacting the hydrocarbon with the nonacidic catalytic composite consisting essentially of, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, 0.01 to about 2 wt. % rhenium, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % tin, and about 0.1 to about 5 wt. % alkali metal or alkaline earth metal uniformly dispersed throughout the porous carrier material, wherein the average crystallite size of the tin and catalytically available cobalt is less than 100 Angstroms in maximum dimension; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrogenation conditions or

in a mixture of these states; and wherein substantially all of the tin and alkali metal or alkaline earth metal are present in an oxidation state above that of the elemental metal, at dehydrogenation conditions.

4,131,629
SELECTIVE HYDROGENATION OF CYCLOPENTADIENE TO CYCLOPENTENE USING RANEY NICKEL CATALYST AND WATER IN THE REACTION MIXTURE

Lawson G. Wideman, Akron, and Eilert A. Ofstead, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 11, 1977, Ser. No. 850,580
Int. Cl.[2] C07C *5/02*
U.S. Cl. 260—666 A **5 Claims**

1. The process for the preparation of cyclopentene which comprises selectively hydrogenating cyclopentadiene in the liquid phase by contacting cyclopentadiene with hydrogen in the presence of a hydrogenation catalyst comprising a highly dispersed form of nickel selected from the group comprising Raney nickel or modified Raney nickel in which water is employed in the reaction mixture wherein the volume ratio of the water to the cyclopentadiene ranges from 1/1 to 4/1.

4,131,630
ISOMERIZATION PROCESS

William B. Hughes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 714,932, Aug. 16, 1976, Pat. No. 4,087,472. This application Feb. 13, 1978, Ser. No. 877,582
Int. Cl.[2] C07C *5/24, 13/28*
U.S. Cl. 260—666 PY **9 Claims**

1. A process for isomerizing an isomerizable olefinic hydrocarbon which comprises contacting said hydrocarbon in the liquid phase under isomerization conditions with a catalyst consisting essentially of a mixture of a nickel complex represented by the formula

$$(R_3P)_2NiX_2$$

wherein X is a halogen selected from the group consisting of chlorine, bromine and iodine, and R is a hydrocarbon radical having from 1 to 10 carbon atoms, and an alkali metal borohydride represented by the formula

$$MBH_3Z$$

wherein M is an alkali metal selected from the group consisting of lithium, sodium and potassium, and Z is —H or —CN and in which the isomerizable olefinic hydrocarbon has from 4 to 20 carbon atoms per molecule and from 1 to 3 ethylenic bonds per molecule.

4,131,631
DEHYDROGENATION OF PARAFFINS

Harley F. Hardman, Lyndhurst, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed Dec. 22, 1975, Ser. No. 643,464
Int. Cl.[2] C07C *3/28*
U.S. Cl. 260—683.3 **15 Claims**

1. The process for the dehydrogenation of paraffinic hydrocarbons containing from 3 to 6 carbon atoms to the corresponding monoolefins comprising contacting said paraffinic hydrocarbon with molecular oxygen, at a temperature of from about 400° to 700° C. and a pressure of from about 1 up to about 3 atmospheres, over a catalyst having the composition:

$$A_a\,Co_b\,Mo_c\,O_x$$

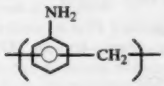
wherein A is one or more of the elements selected from the group consisting of phosphorus and the metals of Groups IA, IIA, VIB and VIII of the Periodic Table, and wherein said catalyst contains at least one element of Group IA or Group IIA;
and wherein a = a number from greater than 0 to 3;
b = a number from 0.1 to 2,
c = a number from 0.1 to 6, and
x is the number of oxygens determined by the valence requirements of the other elements present.

4,131,632
HEAT-RESISTANT RESIN COMPOSITIONS

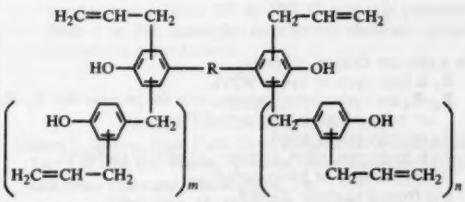
Shuichi Suzuki, Yokohama, and Moriyasu Wada, Kanagawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 27, 1977, Ser. No. 837,203
Claims priority, application Japan, Sep. 28, 1976, 51-115443; Sep. 28, 1976, 51-115444
Int. Cl.[2] C08G *69/02;* C08L *63/00*
U.S. Cl. 260—834 **17 Claims**

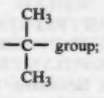
1. A heat-resistant resin composition which comprises
(A) at least one maleimide polymer obtained by reacting maleic anhydride with polyphenyl polyamines containing the repeating units represented by the formula



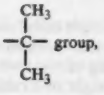
wherein said polyphenyl polyamines have 1 to 5 aniline units and have an amine content of 15 to 16.5% by weight and wherein said polyphenyl polyamines are produced by reaction between aniline and formaldehyde; and wherein in said reaction between maleic anhydride and polyphenyl polyamine, the ratio of amine equivalent to acid equivalent is 1:1 to 1:2;
(B) at least one allylbisphenol compound represented by the formula:



where R is -CH_2-radical or



m and n are each independently zero, or an integer of 1, 2 or 3; each of the allyl groups is positioned ortho to each of the hydroxy groups, and in the case where R is



group,
m and n respectively denote zero; and (C) at least one epoxy resin.

4,131,633

LATENT CATALYSTS FOR PROMOTING REACTION OF EPOXIDES WITH PHENOLS AND/OR CARBOXYLIC ACIDS

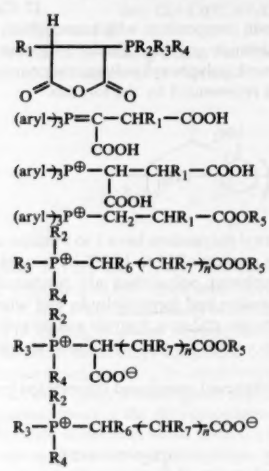
George A. Doorakian, Bedford, Mass.; Dennis L. Schmidt, Houston, Tex., and Martin C. Cornell, III, Sao Paulo, Brazil, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 650,212, Jan. 19, 1976, Pat. No. 4,048,141, which is a continuation-in-part of Ser. No. 629,345, Nov. 6, 1975, abandoned, which is a continuation of Ser. No. 417,844, Nov. 21, 1973, abandoned, which is a continuation-in-part of Ser. No. 290,891, Sep. 21, 1972, abandoned. This application Apr. 11, 1977, Ser. No. 786,314

Int. Cl.[2] C08L 63/02, 63/00

U.S. Cl. 260—837 R 16 Claims

1. A composition comprising (a) an epoxide bearing at least one vicinal epoxy group per molecule; (b) (1) an organic carboxylic acid or anhydride of said acid or (2) a mixture of a phenol and an organic carboxylic acid or anhydride of said acid, and (c) a small but catalytic amount of phosphorus-containing catalyst corresponding to the formula



I,

II,

III,

IV,

V,

VI, or

VII,

or a mixture thereof, wherein:

R_1 is hydrogen or hydrocarbyl,

R_2–R_4 are hydrocarbyl groups, with the proviso that R_2–R_4 are not each aryl in formula VII,

R_5 is hydrogen or alkyl,

R_6 is hydrogen, alkyl, carboxy, or alkoxy carbonyl,

R_7 is hydrogen or hydrocarbyl,

n is from 0 to about 20, and

$A^{\ominus}$ is a compatible anion.

4,131,634

PROCESS FOR THE PREPARATION OF TACKY MIXTURES BASED ON RUBBERY ETHENE COPOLYMERS

Hendrikus J. G. Paulen, Roosteren, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Filed Apr. 21, 1976, Ser. No. 678,877

Claims priority, application Netherlands, Apr. 24, 1975, 7504834

Int. Cl.[2] C08L 9/00, 9/06, 19/00

U.S. Cl. 260—845 11 Claims

1. A tacky rubbery mixture based on a rubbery copolymer of ethylene, at least one other α-alkene, and optionally one or more polyenes, consisting of:

I. 20 to 75 parts by weight of a rubbery copolymer containing 60 to 80% by weight of ethylene, 20 to 40% by weight of another α-alkene, and 0 to 20% by weight of at least one polyene and having, in the unvulcanized state, an elongation at rupture of over 800% and a tensile strength of between 10 and 100 kg/cm^2;

II. 80 to 25 parts by weight of at least one polymer having a Mooney viscosity (ML (1 + 4) 125°) of at least 30 and composed of a conjugated diene selected from the group consisting of styrene-butadiene copolymers, polybutadiene and polyisoprene; and

III. a tackifier resin and conventional fillers and additives, said mixture of I, II and III having an elongation at rupture of at least 800% and a tensile strength of between 1.3 and 50 kg/cm^2.

4,131,635

THERMOSETTING POLYESTER COMPOSITIONS

Frits M. W. Wilschut, Heenvliet, Netherlands, assignor to Synres International B.V., Hoek van Holland, Netherlands

Filed Jan. 25, 1977, Ser. No. 762,791

Int. Cl.[2] C08L 67/06; C08K 00/00

U.S. Cl. 260—862 9 Claims

1. In thermosetting molding compositions composed of (a) a thermosetting polyester copolymer containing copolymerized styrene, (b) a shrinkage-reducing agent, and (c) a curing catalyst the improvement wherein said shrinkage-reducing agent is present in an amount of from 10 to 100% by weight based on the weight of said unsaturated polyester copolymer and is a copolymer of (i) 2 to 10% by weight of an olefinically unsaturated monocarboxylic acid containing 3 to 6 carbon atoms (ii) about 15 to 40% by weight of a dialkyl ester of an unsaturated dicarboxylic acid, in which each alkyl moiety contains 1 to 8 carbon atoms and the dicarboxylic acid moiety contains 4 to 9 carbon atoms, and (iii) the balance being styrene or a mixture of styrene with a minor amount of at least one other monomer.

4,131,636

CROSS-LINKABLE VINYL CHLORIDE RESIN COMPOSITION

Yasuhiro Matsumoto, Nara, and Hisanori Eguchi, Izumiohtsu, both of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo, Japan

Continuation of Ser. No. 674,167, Apr. 6, 1976, abandoned. This application Dec. 28, 1977, Ser. No. 865,129

Claims priority, application Japan, Apr. 10, 1975, 50-42785

Int. Cl.[2] C08L 33/04, 23/08, 51/04

U.S. Cl. 260—875 19 Claims

1. A cross-linkable vinyl chloride resin composition comprising as indispensable components 100 parts by weight of a vinyl chloride resin, 5.0 to 80 parts by weight of an organic peroxide-cross-linkable ethylene polymer elastomer selected from chlorinated polyethylene, ethylene-vinyl acetate copolymers, and ethylene-vinyl acetate-vinyl chloride graft copolymers, 0.1 to 5.0 parts by weight of an anti-scorching agent selected from hindered phenolic compounds, non-hindered phenolic compounds, amino compounds, thiourea compounds and benzimidazole compounds, 1 to 4 parts by weight of a polymerizable compound having at least two double bonds selected from triallyl cyanurate, triallyl isocyanurate, diallyl phthalate, divinylbenzene, trimethylolpropane trimethacrylate and diethylene glycol dimethacrylate and 0.05 to 5.0 parts by weight of an organic peroxide.

4,131,637

GRAFTED POLYMERIC MATERIAL AND PROCESS FOR PREPARING

Philip Bernstein, Yardley; James P. Coffey, Hatboro, and Alan E. Varker, Philadelphia, all of Pa., assignors to ESB Incorporated, Philadelphia, Pa.

Filed Mar. 23, 1977, Ser. No. 780,578

Int. Cl.[2] C08F 255/00

U.S. Cl. 260—877 9 Claims

1. A grafted polymeric composition formed by the process of:

(a) suspending and agitating a quantity of finely divided polymeric material selected from the group consisting of polyethylene, polypropylene, and polyvinylchloride,

wherein the polymeric material is comprised of particles having a particle size of about 15 to 25 microns; and wherein the polymeric material is blended with 0.5–5%, by weight of the polymeric material, silica, and wherein the suspending and agitating is in a fluidized bed at ambient temperature;

(b) introducing ozone into said fluidized bed, at ambient temperature, for activating said material by initiating incipient labile sites in the molecular structure of said material; and

(c) reacting the activating material with an ethylenically unsaturated ionogenic monomer, at an elevated temperature, to graft polymerize the monomer onto said material.

4,131,638

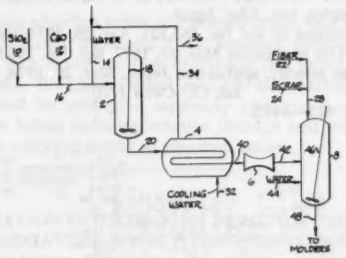
PROCESS FOR THE MANUFACTURE OF CALCIUM SILICATE HYDRATE OBJECTS

Thomas E. Whitaker; Samuel Myles, both of Littleton, Ohio, and Ian P. Gardner, Whitby, Canada, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Jul. 5, 1977, Ser. No. 813,192

Int. Cl.² C04B *1/00*

U.S. Cl. 264—333 **6 Claims**



1. In the process for the formation of shaped calcium silicate hydrate objects which comprises forming an aqueous slurry of a siliceous material and a source of calcium oxide, heating said slurry in a reactor in the presence of saturated steam at a pressure of at least 75 psig for a period of at least 0.5 hour to form hydrated calcium silicate crystals from said siliceous material and said source of calcium oxide, removing from said reactor said hydrated calcium silicate crystals in the form of a slurry of said crystals dispersed in aqueous medium, forming said crystals into shaped objects while simultaneously separating a portion of said aqueous medium from said crystals and then drying said shaped objects, the improvement which comprises:

(a) passing said slurry through a heat exchanger where the temperature of said slurry is substantially reduced; and

(b) thereafter metering the cooled slurry through a venturi wherein the pressure on said slurry is reduced and the flow rate controlled into a receiver, from which receiver said slurry can be subsequently withdrawn for molding into said objects.

4,131,639

SULFURIC ACID EXTRACTION OF URANIUM FROM ITS ORES

James T. Mather, Elliot Lake, Canada, assignor to Rio Algom Limited, Ontario, Canada

Filed Oct. 28, 1976, Ser. No. 736,775

Claims priority, application United Kingdom, Nov. 4, 1975, 45801/75

Int. Cl.² C01G *43/00*

U.S. Cl. 423—20 **8 Claims**

1. A method of extracting uranium values from an ore which contains uranium as a finely-disseminated refractory material, comprising the steps of: wet grinding the ore; dewatering the ground ore; mixing the ground ore with concentrated sulphuric acid; adjusting the sulphuric acid contentration in the moist ore to an initial concentration of less than 4N; curing the moist ore by heating the moist ore to a temperature of from 50° to 100° C. while passing an oxidizing gas through the moist ore; and recovering acid-soluble uranium values from the cured ore by dissolution.

4,131,640

SEPARATING RHODIUM FROM SOLUTION CONTAINING RHODIUM CARBONYL COMPLEXES AND CONVERTING THE SEPARATED RHODIUM INTO SOLUBLE RHODIUM CARBONYL COMPLEXES

Nikolaus von Kutepow, Karlsruhe; Franz J. Mueller, Limburgerhof, and Peter Reuter, Bad Durkheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 4, 1973, Ser. No. 320,847

Claims priority, application Austria, Jan. 7, 1972, 127/72

Int. Cl.² C01G *55/00*

U.S. Cl. 423—22 **7 Claims**

1. A process for separating rhodium from solutions containing rhodium carbonyl complexes and products obtained in the carbonylation of alkanols or of olefinically or acetylenically unsaturated compounds with carbon monoxide and water, and converting the rhodium separated into a soluble rhodium carbonyl complex which comprises:

contacting said solutions with hydrogen at a temperature of from 25° to 300° C. and at a pressure of from 1 to 700 atmospheres in the presence of a carrier such as is conventionally used for hydrogenation catalysts to precipitate the rhodium on the carrier; separating the solution devoid of rhodium; and

contacting the rhodium precipitated onto the carrier with carbon monoxide in the presence of an aliphatic, cycloaliphatic or aromatic hydrocarbon, alkanol, ester, ether, ketone, amine or organic nitro compound as a solvent and in the presence of an olefinicably or acetylenically unsaturated hydrocarbon, organic compound of trivalent nitrogen, phosphorus or arsenic, ammonia, ammonium, phosphonium or arsonium salts or free halogen as a compound capable of replacing the carbon monoxide as a ligand at a temperature of from 20° to 300° C. and at a pressure of from 1 to 700 atmospheres whereby rhodium carbonyl complexes are reformed.

4,131,641

NICKEL RECOVERY PROCESS

Milton S. Brown, Deer Park, Tex.; Richard M. Burch, Kenner, La., and Guy M. Warth, Houston, Tex., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 14, 1977, Ser. No. 851,087

Int. Cl.² C01G *53/08*

U.S. Cl. 423—34 **7 Claims**

4. A process for the continuous recovery of nickel-containing waste sludge which comprises the steps:

(a) filtering and washing a nickel-containing waste sludge with water;

(b) slurrying the washed sludge with a portion of the nickel chloride brine solution obtained in step (e);

(c) reacting the slurry by the sequential addition of the following reactants; oxidizing agent solution, a nickel wash solution obtained in step (f) and anhydrous hydrogen chloride to obtain a nickel chloride containing reaction mix;

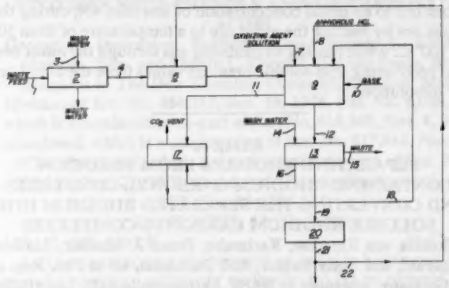
(d) adjusting the pH of the nickel chloride containing reaction mix to 2.5 with a base;

(e) filtering the reaction mix to obtain a nickel chloride brine solution and a filter cake; and

(f) washing the filter cake to obtain a nickel wash solution.

6. The process of claim 4 wherein said sludge also contains

copper and the copper is recovered with nickel and is removed from the nickel chloride brine solution by complexing with an



agent selected from the group consisting of sodium oxalate-oxalic acid, sodium oleate-oleic acid, sodium citrate-citric acid and 8-hydroxyquinoline.

4,131,642

TREATMENT OF THE WASTE FROM THE PRODUCTION OF TERTIARY BUTYL AMINE TO RECOVER SODIUM SULFATE AND METHYL OR SODIUM FORMATE

Ralph Miller, Pleasantville, N.Y., and Harry D. Gregg, Jr., Greensboro, N.C., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 724,746, Sep. 10, 1976, abandoned. This application Aug. 12, 1977, Ser. No. 824,306

Int. Cl.[2] C01D *5/00*; C07C *53/02*; C07B *21/00*

U.S. Cl. 423—193 **9 Claims**

1. A process for the treatment of waste from the production of tertiary butyl amine by:

reacting isobutylene, hydrogen cyanide and sulfuric acid, with a stoichiometric excess of sulfuric acid, then adding more than one mole of sodium hydroxide for each equivalent of sulfuric acid and hydrogen cyanide employed in the initial reaction, thereby forming a heterogeneous mixture containing water, sodium hydroxide, sodium sulfate, N-tertiary butylformamide and an unknown organic substance,

hydrolyzing said N-tertiary butylformamide with said sodium hydroxide to form a heterogeneous mixture in which water, sodium sulfate, sodium hydroxide, tertiary butyl amine, sodium formate and the unknown organic substance are contained,

heating the aforesaid mixture to vaporize and recover said tertiary butylamine, thereby forming a residual waste mixture,

said process comprising recovering values from said residual waste mixture by the steps of:

(a) adding sufficient concentrated sulfuric acid to said residual mixture to bring its pH below 3.5 and sufficient methanol to said mixture so that the molar ratio of methanol to formate is not less than 2;

(b) refluxing the mixture of step (a) to convert substantially all of the formate to methyl formate;

(c) heating the mixture formed in step (b) to vaporize and recover methyl formate and methyl alcohol and leave a mixture which at a temperature above about 50° C. contains three phases, solid sodium sulfate and two immiscible, separable, liquid phases, the less dense liquid phase being a water insoluble, yellow organic substance and the more dense liquid phase being an acidic aqueous sodium sulfate solution;

(d) maintaining the mixture formed in step (c) above about 50° C. and separating the less liquid dense phase from the other two phases; and

(e) recovering anhydrous, white, crystalline sodium sulfate from the residue of step (d).

4,131,643

CATALYST FOR CONVERTING NITROGEN OXIDES AND METHOD FOR CONVERTING NITROGEN OXIDES IN EXHAUST GASES BY USING SAID CATALYST

Kei Utsunomiya, Kobe; Kazuya Soga, Akashi; Katsunori Shimasaki, Kobe; Yutaka Mito, Kobe; Mamoru Oaki, Kobe; Shigeru Haseba, Kobe; Hiroetu Miki, Akashi, and Michiko Masaki, Kobe, all of Japan, assignors to Kobe Steel Limited, Kobe, Japan

Division of Ser. No. 710,330, Jul. 30, 1976, abandoned. This application Sep. 15, 1977, Ser. No. 833,498

Claims priority, application Japan, Sep. 5, 1975, 50/108179

Int. Cl.[2] B01D *53/00*

U.S. Cl. 423—239 **19 Claims**

1. A method for converting nitrogen oxides present in exhaust gases to harmless substances, which comprises:

contacting an exhaust containing nitrogen oxides in the presence of ammonia as a reducing agent at a temperature of 200° to 500° C, and a space velocity of 2,000 to 10,000 hr^{-1} with a catalyst consisting essentially of the oxides of V and Nb.

4,131,644

PROCESS FOR PRODUCING CARBON FIBER

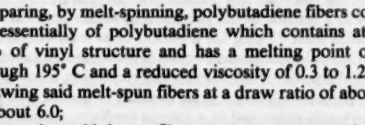
Akira Nagasaka, Chiba; Hidetomo Ashitaka, Ichihara; Yoshihiro Kusuki, Ichihara; Denichi Oda, Ichihara, and Toshimune Yoshinaga, Fukuoka, all of Japan, assignors to Ube Industries, Inc., Ube, Japan

Continuation of Ser. No. 465,131, Apr. 29, 1974, abandoned. This application Mar. 23, 1977, Ser. No. 780,520

Claims priority, application Japan, Mar. 29, 1974, 49-34619

Int. Cl.[2] C01B *31/07*

U.S. Cl. 423—447.5 **9 Claims**



1. A process for producing carbon fibers comprising the steps of:

(a) preparing, by melt-spinning, polybutadiene fibers consisting essentially of polybutadiene which contains at least 85% of vinyl structure and has a melting point of 140 through 195° C and a reduced viscosity of 0.3 to 1.2 dl/g;

(b) drawing said melt-spun fibers at a draw ratio of about 1.3 to about 6.0;

(c) heat setting said drawn fibers at a temperature 20° C less than the melting point of the polybutadiene and not less than 70° C;

(d) treating said polybutadiene fibers with a solution or suspension of a Lewis acid in an amount of 1 to 100 g per 1000 ml of inert organic liquid at a temperature of 0 through 100° C to such an extent that the treated polybutadiene fibers become insoluble in an eutectic mixture of 1 part by weight of diphenyl and 3 parts by weight of diphenylether at a temperature of 120 to 130° C, but still maintain their tensile strength at a level of at least 30% based on the tensile strength of the original polybutadiene fibers to cyclize and cross-link said polybutadiene, said Lewis acid being selected from the group consisting of fluorides, chlorides and bromides of boron, aluminum, titanium, tin, antimony, iron, berylium, magnesium, zinc and cadmium, compounds of the formula (II):

$$R_nAlY_{3-n} \qquad (II)$$

wherein R represents an alkyl radical of 1 to 3 carbon atoms, Y represents a chlorine or bromine atom and n is an integer of 1 or 2, and mixtures of two or more of the above mentioned compounds;

(e) treating said polybutadiene fibers treated in step (d) with a sulphur melt at a temperature of 170 to 300° C under a tensile stress of 4 to 40 kg/cm^2 to such an extent that said treated polybutadiene fibers in this step are rendered to have a ratio (H/C) of the number of hydrogen atoms to carbon atoms in a range of 0.2 to 1.0 to dehydrogenate and aromatize said polybutadiene treated in step (d), and then,

(f) carbonizing said fibers treated in step (e) by heating them to a temperature of 750° to 3000° C, whereby said fibers are converted into carbon fibers.

4,131,645
IODINE RECOVERY PROCESS

Kestutis A. Keblys, Southfield, and John M. McEven, Lake Orion, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 21, 1974, Ser. No. 525,870
Int. Cl.^{2} C01B 7/14
U.S. Cl. 423—501 **7 Claims**

1. In a process for recovering iodine from brine containing recoverable amounts of iodide, said process comprising repeating cycles of

(1) passing said brine without acidification or oxidation through a basic anion exchange resin to adsorb iodide ion, and

(2) oxidizing adsorbed iodide to adsorbed iodine, said cycles being repeated until said resin becomes substantially loaded with iodine and then recovering said iodine from said resin, the improvement wherein said oxidizing is conducted by passing a separately prepared acidified aqueous iodate oxidizing solution through said resin to convert adsorbed iodide to adsorbed iodine.

4,131,646
PREPARATION OF HYDROGEN PEROXIDE FROM DIHYDROANTHRACENE HYDROPEROXIDES

Lawrence W. Gosser, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 16, 1977, Ser. No. 833,896
Int. Cl.^{2} C01B 15/02, 15/022
U.S. Cl. 423—591 **10 Claims**

1. An improved process for producing hydrogen peroxide comprising:

(a) hydrogenating a compound containing the anthracene nucleus to the corresponding 9,10-dihydroanthracene compound;

(b) oxidizing the 9,10-dihydroanthracene compound so produced to the corresponding hydroperoxide;

(c) contacting the hydroperoxide so produced with a catalytic amount of an acid catalyst to produce hydrogen peroxide and the starting compound containing the anthracene nucleus;

(d) recycling the anthracene compound so produced to step (a); and

(e) repeating steps (a) through (d) as desired and recovering the hydrogen peroxide.

4,131,647
DEUTERATED METHYLENE CHLORIDE USED AS A SOLVENT TO REDUCE TOXICITY

Leslie P. McCarty, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 11, 1977, Ser. No. 823,575
Int. Cl.^{2} B01F 1/00; C23G 5/02
U.S. Cl. 424—10 **4 Claims**

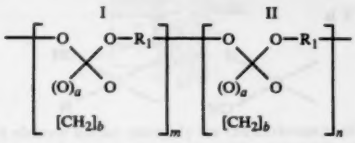
1. In a solvent composition comprising methylene chloride for applications where mammals can be exposed to said methylene chloride in liquid or vapor form, the improvement which comprises replacing at least a portion of said methylene chloride with deuterated methylene chloride.

4,131,648
STRUCTURED ORTHOESTER AND ORTHOCARBONATE DRUG DELIVERY DEVICES

Nam S. Choi, Seoul, Korea, and Jorge Heller, Palo Alto, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 544,805, Jan. 28, 1975, Pat. No. 4,093,709.
This application Mar. 2, 1978, Ser. No. 882,814
Int. Cl.^{2} A61K 9/22, 9/24, 9/26, 9/32
U.S. Cl. 424—22 **7 Claims**

1. A drug delivery device for the controlled administration of drug wherein the device comprises: (a) a matrix shaped, sized and adapted for administering drug to an animal and formed of a hydrophobic, bioerodible, drug release rate controlling material, which material is a copolymer comprising mers I and II according to the following formula:



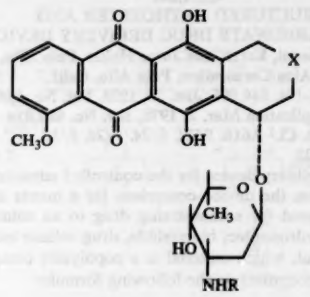
wherein R_1 is a member selected from the group consisting of alkylene of 1 to 10 carbons; alkenylene of 2 to 10 carbons; alkyleneoxy of 2 to 6 carbons; cycloalkylene of 3 to 7 carbons; cycloalkylene of 3 to 7 carbons substituted with a member selected from the group consisting of alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons; cycloalkenylene of 4 to 7 carbons; cycloalkenylene of 4 to 7 carbons substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, and an alkenyl of 2 to 7 carbons; arylene; and arylene substituted with an alkyl of 1 to 7 carbons, an alkoxy of 1 to 7 carbons, an alkylene of 1 to 10 carbons, an alkenyl of 2 to 7 carbons; and wherein a is 0 to 1; b is 2 to 6; m is greater than 10; n is greater than 10; and at least one of R_1, a, and b in mer I is different than R_1, a, and b in mer II; a drug present in the matrix; and (c) wherein the device when in operation bioerodes and releases drug at a rate selected from (1) a zero order rate, (2) a continuous rate, and (3) a variable rate, which rate is produced by preselecting the copolymer, the drug, and the geometric shape forming the device to give the desired result.

4,131,649
DAUNORUBICIN DERIVATIVES, THEIR PREPARATION AND THEIR USE

Sergio Penco; Francesco Angelucci, and Federico Arcamone, all of Milan, Italy, assignors to Societa Farmaceutici Italia S.p.A., Milan, Italy

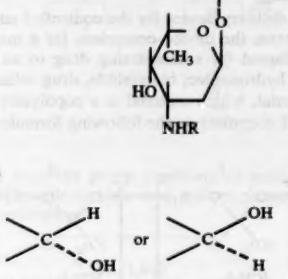
Filed Jun. 27, 1977, Ser. No. 810,077
Claims priority, application United Kingdom, Jul. 13, 1976, 28986/76
Int. Cl.^{2} A61K 31/70; C07H 15/24
U.S. Cl. 424—180 **8 Claims**

1. A compound of the formula I:



I

wherein X is



and R is $-COCF_3$ or H.

8. A method of inhibiting the growth of P 388 lymphocytic leukemia which comprises intraperitoneally administering to a host afflicted therewith, a compound according to claim 1, wherein R is hydrogen in an amount sufficient to inhibit the growth thereof.

4,131,650

COLLAGEN FOIL FOR COSMETIC APPLICATION

Klaus Bräumer, Weinheim, and Zdenek Eckmayer, Heidelberg, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Apr. 9, 1976, Ser. No. 675,363

Claims priority, application Fed. Rep. of Germany, Apr. 19, 1975, 2517452

Int. Cl.[2] A61K *9/70;* **A01N** *5/00;* **A61F** *13/00*

U.S. Cl. 424—28 **10 Claims**

1. In the treatment of skin wherein an aqueous cosmetically-active paste is applied to the skin, left in contact therewith for a period of time and thereafter removed, the improvement which comprises placing over the paste a collagen-foil containing at least about 3 percent of water soluble collagen by weight and having a water permeability of more than about 0.1 gram/dm^2/minute, whereby collagen is transported through the paste and is absorbed by the skin.

4,131,651

TREATMENT OF DRY EYE

Dinesh O. Shah, Gainesville, Fla., and Murray J. Sibley, Berkeley, Calif., assignors to Barnes-Hind Pharmaceuticals, Inc., Sunnyvale, Calif.

Filed Oct. 25, 1977, Ser. No. 844,555

Int. Cl.[2] A61K *31/74*

U.S. Cl. 424—78 **2 Claims**

1. A method for the treatment of dry eye which comprises applying to the eye of a host having dry eye an aqueous solution containing from 0.1 to 10 weight percent of a polymer combination of hydroxyethylcellulose and polyvinyl alcohol of about 80 weight percent and about 20 weight percent respectively and has a viscosity of from 3,000 to 8,000 at a two weight percent aqueous solution, Brookfield viscosity, 25° C. and said polyvinyl alcohol has a viscosity of from about 1 to 20 at a 4% w/v solution, ASTM 882.

4,131,652

MEDICINAL SKIN CREAM FOR PSORIASIS AND METHOD

Charles R. DeLuccia, 2 Maple Ave., Rye, N.H. 03871

Filed Jun. 22, 1977, Ser. No. 808,866

Int. Cl.[2] A61K *31/58*

U.S. Cl. 424—241 **3 Claims**

1. A medicinal compound administered as a skin cream and comprising a mixture of 1 gram to 10 grams of acetohexamide to 28 grams of 0.01% to 1% steroid hormone cream taken from the group consisting of triamcinolone and triamcinole acetonide.

4,131,653

EPOXIDIZED BLOCK COPOLYMERS

Henry L. Hsieh, and Kishore Udipi, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

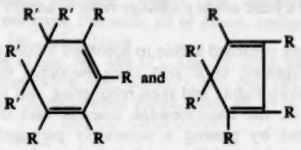
Filed Sep. 9, 1977, Ser. No. 832,121

Int. Cl.[2] C08F *297/04*

U.S. Cl. 260—880 B **15 Claims**

1. An epoxidized block copolymer comprising:

(a) units of a 1,3-cyclodiene represented by the general formulas



wherein R is selected from the group consisting of hydrogen, methyl, and ethyl radicals, R′ is selected from the group consisting of hydrogen, cycloalkyl, aryl, and linear and branched alkyl radicals such that the maximum number of carbon atoms per R′ radical is about 6 and the total number of carbon atoms per cyclodiene monomer is in the range of from about 5 to 20;

(b) units of at least one acyclic conjugated diene;

(c) optionally, units of a vinyl aromatic compound containing in the range of from about 8 to about 14 carbon atoms per molecule; and wherein the extent of epoxidation of said copolymer, as defined by the ratio of the number of epoxidized groups formed to the number of initial olefinic double bonds, ranges from about 5 to about 80 percent with the further proviso that said block copolymer contains:

(1) blocks of said 1,3-cyclodiene and blocks of said acyclic conjugated diene when said block copolymer does not contain units of said vinyl aromatic compound and

(2) blocks of said 1,3-cyclodiene and blocks containing a random arrangement of said acyclic conjugated diene and said vinyl aromatic compound when said copolymer contains units of vinyl aromatic compound.

4,131,654

THERMOPLASTIC POLYMER BLENDS COMPRISING EPDM, E/EA COPOLYMER AND OPTIONALLY P.E.

Richard M. Herman, Elyria, and Martin Batiuk, Grafton, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 28, 1977, Ser. No. 855,137

Int. Cl.[2] C08L *23/16*

U.S. Cl. 260—897 B **12 Claims**

1. A thermoplastic polymer blend comprising

(1) 100 weight parts of at least one EPDM polymer consisting essentially of interpolymerized units of about 63 wt.% to about 85 wt.% ethylene, about 5 wt.% to about 37 wt.% propylene, and about 0.2 wt.% to about 15 wt.% of a diene monomer, and

(2) from about 5 weight parts to 500 weight parts of at least one ethylene-ethyl acrylate (EEA) polymer consisting

essentially of interpolymerized units of about 60 wt.% to about 98 wt.% ethylene, and about 2 wt.% to about 40 wt.% ethyl acrylate.

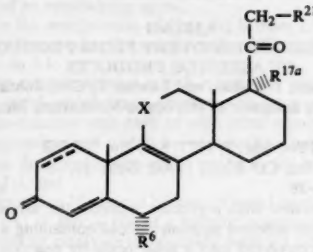
4,131,655

D-HOMOPREGNANES

Leo Alig, Kaiseraugst; Andor Fürst, Basel; Marcel Müller, Frenkendorf, all of Switzerland; Ulrich Kerb, and Rudolf Wiechert, both of Berlin, Germany, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed Apr. 20, 1978, Ser. No. 898,070
Claims priority, application Luxembourg, Apr. 21, 1977, 77173; Switzerland, Jan. 6, 1978, 139/78
Int. Cl.[2] C07F 9/09; C07C 49/44
U.S. Cl. 260—946 20 Claims

1. A compound of the formula



I

wherein R^6 is hydrogen, chloro, fluoro or methyl; X is β-hydroxymethylene or carbonyl; R^{17a} is hydroxy, lower alkanoyloxy or aroyloxy; R^{21} is hydrogen, chloro, fluoro, hydroxy, lower alkanoyloxy, aroyloxy, sulfate or phosphate; and the dotted line in the 1,2-position of the A-ring denotes an additional carbon-carbon bond
or a pharmaceutically acceptable salt thereof.

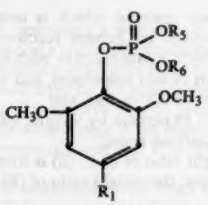
4,131,656

INTERMEDIATES FOR 5-(TERTIARY ALKYL) RESORCINOL PREPARATION

Samuel J. Dominianni, and Charles W. Ryan, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 695,674, Jun. 14, 1976, Pat. No. 4,087,410.
This application Feb. 1, 1978, Ser. No. 874,183
Int. Cl.[2] C07F 9/02
U.S. Cl. 260—951 10 Claims

1. A compound of the formula



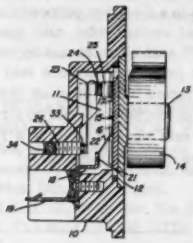
wherein:
R_1 is adamantyl or $—CR_2R_3R_4$, in which:
R_2 and R_3 independently are C_1–C_6 alkyl;
R_4 is C_1–C_6 alkyl, phenyl, cycloalkyl, or adamantyl, and
R_5 and R_6 independently are C_1–C_3 alkyl or phenyl, or taken together are ethylene or proplylene.

4,131,657

ELECTRIC AUTOMOTIVE CHOKE

George A. Ball, Jr., Cape Elizabeth, and George H. Simpson, Westbrook, both of Me., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 10, 1977, Ser. No. 776,396
Int. Cl.[2] F02M 1/12
U.S. Cl. 261—39 E 9 Claims



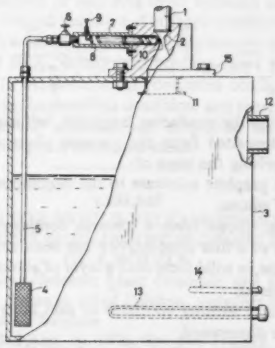
1. An electric choke assembly for the carburetor of an automotive internal combustion engine comprising a housing having a chamber therein a thermistor disc and a thermostat blade disposed in said chamber so that the thermostat blade is proximate the thermistor disc and in heat-transfer relationship therewith, the thermostat blade being open below a predetermined temperature range and closed above said temperature range, the thermistor disc generating heat at one rate when the thermostat blade is open and at a greater rate when the thermostat blade is closed, and means to electrically energize the assembly.

4,131,658

METHOD FOR ATOMIZING OIL AND AN APPARATUS THEREFOR

Masakuni Hirata, Tokyo, and Yukio Matsuzaki, Kawasaki, both of Japan, assignors to Nippon Oil Company Limited, Tokyo, Japan

Continuation of Ser. No. 681,192, Apr. 28, 1976, abandoned.
This application Jan. 31, 1978, Ser. No. 873,901
Claims priority, application Japan, Jul. 17, 1975, 50/86661
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—142 10 Claims



1. A method for atomizing oil which comprises the steps of supplying a highly viscous oil stream from a reservoir to a gas stream from a nozzle having a discharge axis located perpendicular to the direction of the axis of said gas stream, passing said gas stream through a venturi throat located in direct opposition to the nozzle, passing the oil stream to be atomized through a heating chamber located downstream of said reservoir and just prior to discharging the oil from the nozzle,

heating only the oil and only that portion of the oil that is in said heating chamber, passing said heated oil through said nozzle, contacting said heated stream of oil with the gas stream and atomizing the oil.

4. An oil-atomizing apparatus which comprises an oil reservoir provided with a top wall and an opening for discharging an oil mist at a side wall of said reservoir; a venturi tube having a throat therein for a gas to be supplied, said venturi tube extending through said top wall and into said reservoir; a nozzle which opens in a direction perpendicular to the axis and at the throat of said venturi tube, said nozzle being in fluid communication with said oil reservoir by means of a conduit; a heating chamber provided between said conduit and said nozzle and heating means in said heating chamber to heat only the quantity of the oil therein just prior to the discharge thereof into the throat of said venturi tube at a right angle to the direction of gas flow therethrough.

4,131,659
PROCESS FOR PRODUCING LARGE-SIZE, SELF-SUPPORTING PLATES OF SILICON

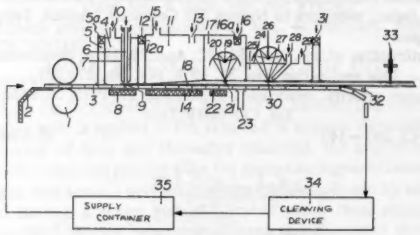
Bernhard Authier; Rudolf Griesshammer, both of Burghausen; Franz Köppl, Altötting; Winfried Lang, Burghausen; Erhard Sirtl, Marktl, Inn, and Heinz-Jörg Rath, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Fed. Rep. of Germany

Filed Nov. 19, 1976, Ser. No. 743,268

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1976, 2638270

Int. Cl.² H01L *21/205*

U.S. Cl. 264—25 **10 Claims**



1. A process for producing large-size, self-supporting plates of silicon deposited from the gaseous phase on a substrate body, comprising the steps of:

heating a graphite substrate to the decomposition temperature of silicon;

depositing silicon from a gaseous compound to which a dopant of a first conductivity has been added, upon said substrate, in solid form until a layer of about 200 to 600 μm has formed;

subsequently melting 40–100% of said layer from the free surface downward;

resolidifying the molten silicon from the substrate body upwardly to the free surface of the molten silicon layer to effect an oriented growth of the resolidifying silicon from the substrate toward the free surface, said resolidifying step being effected by maintaining a vertically directed temperature gradient between the lower surface and the free surface of said molten layer until said molten layer is completely resolidified; and

finally separating the silicon from said substrate.

4,131,660
METHOD OF EVALUATING SCORCH IN FLEXIBLE POLYURETHANE FOAM

Barry A. Jacobs, Bethel, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 23, 1977, Ser. No. 854,288

Int. Cl.² B29D *27/04*

U.S. Cl. 264—26 **1 Claim**

1. A method of evaluating scorch in flame retarded flexible polyurethane foam comprising heating a flame retarded flexible polyurethane foam sample having an internal temperature from about 120° C. to about 180° C. with microwave radiant energy from about 2.5 to about 7 kilocalories per minute for from about 2 minutes to about 30 minutes, then allowing said sample to cure at room temperature followed by slicing said sample and measuring the color of the sliced surface and finally comparing that color measurement to the measured color of a sliced surface of an identically formulated and cured non-flame retarded flexible polyurethane foam.

4,131,661
WASTE ASBESTOS RECOVERY FROM PRODUCTION OF ASBESTOS PRODUCTS

Edward K. Spitz, Hanahan, and Lawton E. Cox, Johns Island, both of S.C., assignors to Raybestos-Manhattan, Inc., Trumbull, Conn.

Filed Apr. 7, 1977, Ser. No. 785,363

Int. Cl.² B29H *19/00*; D01F *13/00*

U.S. Cl. 264—38 **6 Claims**

1. In connection with a process wherein the asbestos in a dispersion of an asbestos aqueous colloid containing a soluble surfactant is converted into a solid body by reaction with a heavy metal ion to render the surfactant insoluble, a process for recovering asbestos waste containing precipitated surfactant comprising the steps of: acidifying the waste by the addition of a dilute inorganic acid to solubilize the heavy metal ions, washing the waste to remove the heavy metal ions, converting the precipitated insoluble surfactant in said waste into a water soluble surfactant by reaction with an inorganic alkali, and returning the asbestos and soluble surfactant to said dispersion for reprocessing.

4,131,662
TALC-BASED EXTERNAL MOLD RELEASE AGENT FOR POLYURETHANE FOAMS

Mark E. Cekoric, North Versailles; Robert M. Loring, and William A. Ludwico, both of Library, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Jan. 3, 1978, Ser. No. 866,449

Int. Cl.² C08G *18/14*; B29C *1/04*; C09K *3/00*

U.S. Cl. 264—51 **6 Claims**

1. A mold release composition comprising a stable suspension of

(A) an oil-in-water emulsion prepared by mixing

(i) water

(ii) an organic material which is immiscible in water, which contains no groups reactive with isocyanate groups, which is non-reactive with itself or with other components of said suspension, and which has a molecular weight of 200 or less, and

(iii) from 3 to 10 percent by weight, based on (i) plus (ii), of an emulsifying agent,

wherein the weight ratio of (i) to (ii) is from 1:1 to 4:1;

(B) a talc powder, the weight ratio of (B) to (A) being from 1:5 to 3:1;

(C) an organic solvent which is miscible with said organic material, which is non-reactive with isocyanates, which is non-reactive with itself or with other components of said suspension, and which has a molecular weight of 200 or less, the weight ratio of (C) to (A) + (B) being from 15:1 to 1:1, and

(D) from 0 to 10 percent by weight based on the total weight

of (A) + (B) + (C) of a metallic compound which promotes or catalyzes the reaction between active hydrogen containing materials and isocyanate groups,

with the further proviso that component (B) comprises from 1 to 20 percent by weight of (A) + (B) + (C) + (D).

4. In a method of molding a polyurethane foam in a closed mold comprising applying a release composition to the mold surface, injecting polyurethane forming materials into the mold and thereafter allowing said polyurethane to foam, the improvement wherein the mold release composition comprises a stable suspension of

(A) an oil-in-water emulsion prepared by mixing

(i) water

(ii) an organic material which is immiscible in water, which contains no groups reactive with isocyanate groups, which is non-reactive with itself or with other components of said suspension, and which has a molecular weight of 200 or less, and

(iii) from 3 to 10 percent by weight, based on (i) plus (ii), of an emulsifying agent,

wherein the weight ratio of (i) to (ii) is from 1:1 to 4:1;

(B) a talc powder, the weight ratio of (B) to (A) being from 1:5 to 3:1;

(C) an organic solvent which is miscible with said organic material, which is non-reactive with isocyanates, which is non-reactive with itself or with other components of said suspension, and which has a molecular weight of 200 or less, the weight ratio of (C) to (A) + (B) being from 15:1 to 1:1, and

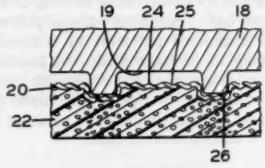
(D) from 0 to 10 percent by weight based on the total weight of (A) + (B) + (C) of a metallic compound which promotes or catalyzes the reaction between active hydrogen containing materials and isocyanate groups, with the further proviso that component (B) comprises from 1 to 20 percent by weight of (A) + (B) + (C) + (D).

4,131,663

MULTILEVEL EMBOSSING OF SHEET MATERIALS

Walter J. Lewicki, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed May 6, 1975, Ser. No. 574,860
Int. Cl.² B31F *1/00*
U.S. Cl. 264—40.2 **2 Claims**



1. A process for embossing a web of material wherein said material is composed of a composite structure having a carrier, a non-foamed embossable wear layer and a foamed layer therebetween, said foamed layer on the surface thereof adjacent the wear layer having a decorative pattern printed thereon, said above composite structure being in the form of a web which is heated to a temperature of about 225° F. to 350° F., the process comprising:

(a) embossing the embossable wear layer of the web with a first shallow embossing means which embosses a surface texture of about 5 mils to a substantial portion of the embossable wear layer including areas to be further embossed and particularly including areas which will not be subsequently embossed.

(b) deeply embossing in a pattern the embossable wear layer of the web with a "bottomless" embossing means to emboss deeply to about 15 mils a portion of the web to form depressed area therein while, at the same time, not contacting or embossing the raised areas of the web between the depressed areas of the web,

(c) carrying out the step of deep embossing without destroying at the point of deep embossing the surface texturing which was previously applied by the first embossing step, and

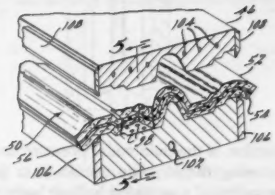
(d) laterally guiding the web to the embossing means so as to provide a registry of the embossed pattern with the printed pattern in a direction transverse to the direction of web movement.

4,131,664

METHOD OF MAKING A MULTIPLE-DENSITY FIBROUS ACOUSTICAL PANEL

Thomas A. Flowers, Royal Oak; Anthony W. Marra, Sterling Heights, and Samuel D. Vinch, Detroit, all of Mich., assignors to Allen Industries, Inc., Troy, Mich.

Filed Sep. 28, 1977, Ser. No. 837,313
Int. Cl.² B29C *17/04*; B32B *1/10*
U.S. Cl. 264—510 **18 Claims**



1. The method of making an acoustical and thermal insulating fibrous panel which comprises the steps of forming a composite fibrous pad comprising a first fibrous layer and a second fibrous layer disposed in overlying relationship each of substantially uniform thickness and density incorporating a binding agent distributed therethrough and a flexible impervious film disposed between the opposed faces of said first layer and said second layer, positioning said pad with said first layer disposed in overlying relationship adjacent to a mold having a preselected contour, applying a pneumatic pressure through said second layer against said film of a magnitude sufficient to effect a compaction of said first layer between said film and said mold to a desired density and in shape-conforming contact with said mold without effecting any appreciable densification of said second layer, setting said binding agent to retain the fibrous layers in the preselected contoured configuration and said first layer in the densified condition, and thereafter releasing said pneumatic pressure and extracting the contoured dual-density trim panel from said mold.

4,131,665

PROCESS FOR MOULD RELEASE OF HOLLOW PLASTIC BODIES MOULDED BY BLOWING BY MEANS OF A NOZZLE

Luc Bodson, Grez-Doiceau; Marc Obsomer, and Edmond Michel, both of Brussels, all of Belgium, assignors to SOLVAY & Cie., Brussels, Belgium

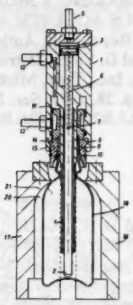
Filed Aug. 16, 1976, Ser. No. 714,822
Claims priority, application France, Aug. 18, 1975, 75 25715
Int. Cl.² B29C *17/07*
U.S. Cl. 264—572 **7 Claims**

1. Process for mould release of a hollow plastic body which has been subjected to a blow moulding operation by means of a blowing nozzle and a mould having two mould halves and a removable bottom portion, for the purpose of moulding the body from an initial form into the form of a finished article of biaxially oriented material, the initial form being a preform having a closed base and a height which is less than that of the

finished article, and in which, after cooling the hollow body and opening the mould, a fluid under pressure is injected into the hollow body through the nozzle comprising:

opening the mould by removing the removable bottom portion and separating the two mould halves for the body by a distance which, at the top of the mould halves, is les than the maximum diameter of a properly blown moulded hollow body,

thereafter injecting the fluid under pressure into the bottom region of the hollow body with a pressure which normally is sufficient to cause release of a properly blown moulded hollow body from the mould;



after the injection of the fluid under pressure into the hollow body, removing the blowing nozzle from the mould by retraction so that if a moulded hollow body is still on the nozzle during the retraction, the moulded hollow body will be held back during the retraction by the two mould halves resulting in extraction of the nozzle from the neck of the hollow body and release of the moulded hollow body from the mould,

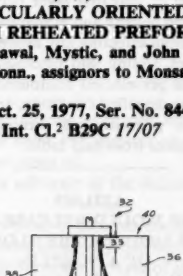
after the removing of the blowing nozzle by retraction, operating an ejector which acts from the outside at the neck position of the hollow body, said ejector releasing the hollow body if the hollow body is incompletely blown and has not as yet been released.

4,131,666

FORMING MOLECULARLY ORIENTED CONTAINERS FROM REHEATED PREFORMS

Purushottam D. Agrawal, Mystic, and John E. Griesing, East Granby, both of Conn., assignors to Monsanto Company, St. Louis, Mo.

Filed Oct. 25, 1977, Ser. No. 844,652
Int. Cl.² B29C *17/07*
U.S. Cl. 264—521 **7 Claims**



1. A method of forming containers from injection molded preforms of thermoplastic material which comprises:

providing preforms having predetermined dimensional characteristics such that shrinkage during heating to orientation temperature is maintainable within predetermined limits;

heating such preforms to such temperature through temperature programming by exposing the preforms to a plurality of separate heating zones disposed along the length thereof while maintaining shrinkage to between about 4 to 15% of the total initial preform length; and then

axially and radially stretching such heated preforms at least about 30% and about 100% respectively while maintaining total % axial and radial stretch between about 130 to 280 to form the containers, whereby strength is developed and thickness variability minimized.

4,131,667

PREPARATION OF POLYURETHANE COMPOSITE MOLD BY INJECTION MOLDING

John A. Lovell, Monroe Falls; Donald V. Hillegass, Alliance, both of Ohio, and Philip G. Harris, Clemson, S.C., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 508,362, Sep. 23, 1974, abandoned. This application May 7, 1976, Ser. No. 684,132
Int. Cl.² B29C *1/02*; B29G *3/00*
U.S. Cl. 264—571 **2 Claims**

1. A method of preparing a flexible polyurethane mold which, in turn, can be used for preparing molded articles which comprises (A) positioning a master form so that it is a part of a cavity, (B) applying a reduced pressure to said cavity, (C) injecting a polyurethane reaction composite onto said master form in said cavity while maintaining a reduced pressure therein, (D) curing the mixture in said cavity under a pressure greater than atmospheric pressure to form a shaped article and (E) removing said article from said master form; where said composite reaction mixture contains less than about 5 weight percent of a volatile organic solvent and comprises 100 parts by weight of an inorganic water insoluble inert granular material of an average specific gravity of greater than one with a particle size in the range of about 25 to about 500 mesh and about 50 to about 200 parts by weight of a liquid polyurethane reaction mixture characterized by being non-Newtonian and having a sprayability equivalent to a Newtonian fluid having a viscosity in the range of about 2000 to about 1,000,000 centipoises at about 25° C., which consists essentially of (A) an organic polyisocyanate having an isocyanato content of 2 to 3 and (B) a liquid polymeric polyol having a molecular weight in the range of about 700 to about 5,000, so long as it is liquid, selected from at least one of polyester polyols, polyether polyols and hydroxyl terminated polymers of conjugated diene hydrocarbons having an average hydroxyl functionality of from 2 to about 3 and where the ratio isocyanato groups of the polyisocyanate to hydroxyl groups of the liquid polymeric polyol is in the range of from about 0.8/1 to about 2/1.

4,131,668

IRON ORE PELLET PROCESS CONTROL

Minoru Sasaki; Kaoru Ito, both of Yokohama; Katsuhiro Minamida, Kawasaki, and Keiki Fujita, Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 516,663, Oct. 2, 1974, abandoned. This application Jul. 21, 1976, Ser. No. 707,570
Claims priority, application Japan, Mar. 15, 1974, 49-29721
Int. Cl.² B01J *2/12*
U.S. Cl. 264—40.4 **5 Claims**

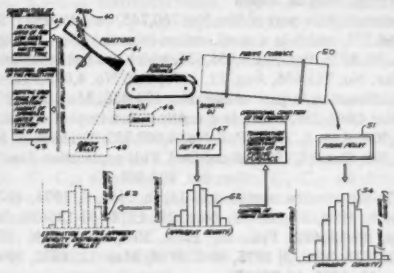
1. In a method of controlling an iron ore pelletizing and pellet processing operation in accordance with an evaluation of the dry and fired pellets sampled from a process stream, having material pretreating, pelletizing, drying and firing steps, said steps having predetermined control parameters associated therewith, the improvement comprising the steps of:

a) periodically cutting a dry pellet sample from the process stream in sequence;

b) measuring the apparent specific gravity of each of the dry pellet samples to find a distribution thereof;

c) comparing the apparent specific gravity distribution of said measured sample with a predetermined apparent specific gravity distribution standard;

d) readjusting the material pretreating, and pelletizing control parameters when the measured apparent specific gravity departs excessively from the predetermined standard, said readjustment for returning the apparent specific gravity of the dried pellets to the predetermined standard;



e) temporarily readjusting said predetermined firing control parameters of the firing furnace so as to compensate for the measured apparent specific gravity of the dry pellet samples to produce a fired pellet having desired apparent specific gravity distribution, said firing control parameters being readjusted until the dried pellet samples return to the predetermined standard; and

f) returning said firing control parameters to the predetermined values.

4,131,669

SOLUTION OF POLYHYDROXY METHYLENE AND PRODUCTS MADE THEREFROM

Walter S. Creasy, Bridgewater, and Herbert K. Reimschuessel, Morristown, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Nov. 25, 1977, Ser. No. 854,876

Int. Cl.[2] D01D *5/08*

U.S. Cl. 264—178 F **14 Claims**

8. A method for making filament of a polymer selected from the group consisting of (a) poly(hydroxymethylene), (b) copolymers thereof with up to about 30 mol percent of ethylenically unsaturated comonomers, and (c) mixtures thereof which comprises introducing a spinning solution comprising a solution of said polymer, in an aqueous solvent mixture of a concentration of between about 20 weight percent to saturation of lithium chloride, bromide or iodide by means of a spinneret into a spinning bath comprising an aqueous lithium chloride-bromide-or iodide-miscible nonsolvent for said polymer to precipitate said polymer in filamentary form from the spinning solution.

4,131,670

METHOD OF MAKING PREFABRICATED BUILDING COMPONENTS OF EXPANDED MATERIAL AND CEMENT

Giorgio Abate, Modena, Italy, assignor to Solai Vignola di Fabiani Orlando e C.-Societa in nome collettivo, Ancona, Italy

Division of Ser. No. 720,749, Sep. 7, 1976. This application May 23, 1977, Ser. No. 799,713

Claims priority, application Italy, Sep. 5, 1975, 40085 A/75; Dec. 18, 1975, 40132 A/76; Dec. 18, 1975, 40133 A/75; Apr. 8, 1976, 40057 A/76

Int. Cl.[2] B28B *1/16*

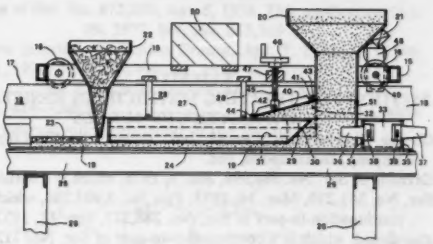
U.S. Cl. 264—256 **3 Claims**

1. A method for making prefabricated building components formed of an insulating concrete mix, comprising:

forming said mix of light-weight material, adhesive and cement;

casting said insulating concrete mix in an elongated mold defining side walls and a bottom wall for the prefabricated building component to be formed from said insulating concrete mix;

providing an elongated shaping hull in said mold, said shaping hull extending below the upper surface of the insulating concrete mix, said shaping hull having an upper level, a bottom molding surface, side molding surfaces extending between said upper level and said bottom molding surface, an upstream end and a downstream end wherein said hull is adapted to form a longitudinal channel in said cast insulating concrete mix, the upstream end of said hull being provided with three triangular faces meeting at an apex located at approximately said upper level, said faces



including a lower face sloping downwardly and rearwardly from the apex and two side faces each sloping laterally outwardly and rearwardly from said apex;

moving said casting mix relative to said hull from the upstream end of said hull to the downstream end thereof, and simultaneously causing said hull to penetrate into said insulating concrete mix, to compress said mix laterally and downwardly, and to form a channel of generally rectangular cross section therein; and

inserting into said channel longitudinally extending reinforcing elements, said reinforcing elements including laterally outwardly projecting appendices, and forcing said outwardly projecting appendices into said insulating concrete mix at locations adjacent the bottom of said channel.

4,131,671

METHOD OF TREATMENT

Zalman Amit, Montreal, Canada, and Sven Ö. Ogren, Södertälje, Sweden, assignors to Astra Lakemedel Aktiebolag, Södertälje, Sweden

Filed Jul. 5, 1977, Ser. No. 812,690

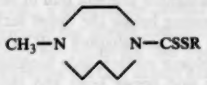
Claims priority, application Sweden, Jul. 5, 1976, 7607657

Int. Cl.[2] A61K *31/35*

U.S. Cl. 424—244 **6 Claims**

1. A method of reducing a preference for alcohol, comprising administering to a host having an acquired preference for

alcohol an amount effective to reduce said preference of the compound defined by the structural formula



wherein R is a pharmacologically acceptable, non-toxic cation.

4,131,672

METHOD FOR TREATING METHICILLIN RESISTANT *STAPHYLOCOCCUS AUREUS*

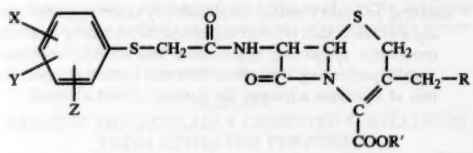
George W. Huffman, Carmel, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 584,998, Jun. 9, 1975, which is a division of Ser. No. 341,210, Mar. 14, 1973, Pat. No. 3,907,784, which is a continuation-in-part of Ser. No. 288,227, Sep. 11, 1972, abandoned, which is a continuation-in-part of Ser. No. 212,739, Dec. 27, 1971, abandoned. This application Jun. 16, 1977, Ser. No. 807,090

Int. Cl.[2] A61K *31/545*

U.S. Cl. 424—246 **13 Claims**

1. A method for treating an infection caused by methicillin resistant strains of *Staphylococcus aureus* which comprises administering to a patient having said infection a compound in an amount effective to combat said infection, said compound having the formula



wherein Z is hydrogen or fluorine; and, when Z is hydrogen, each of X and Y is hydrogen or chlorine selected so that the phenyl ring is substituted with 1 or 2 chlorine atoms and so that when one chlorine atom is present said chlorine atom is in the 3-position, and when two chlorine atoms are present said chlorine atoms are in the 3,4-, the 3,5- or the 2,5-positions; and,

when Z is fluorine said fluorine is in the 3- or 4-position of the phenyl ring, and each of X and Y is hydrogen or chlorine selected so that when the phenyl ring is substituted with 1 or 2 chlorine atoms, one of the chlorine atoms is in the 3- or 4-position of the phenyl ring;

R is selected from the group consisting of 5-methyl-1,3,4-thiadiazol-2-ylthio, 1-methyl-1H-tetrazol-5-ylthio, 1H-tetrazol-5-ylthio, 5-phenyl-1,3,4-oxadiazol-2-ylthio, 5-(p-nitrophenyl)-1,3,4-oxadiazol-2-yl thio, and 5-(p-methoxyphenyl)-1,3,4-oxadiazol-2-ylthio; and

R′ is hydrogen, dicyclohexylamine, or a pharmaceutically acceptable cation.

4,131,673

N[2]-ARYLSULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo and Shosuke Okamoto, Hyogo, both of, Japan

Continuation-in-part of Ser. No. 760,745, Jan. 19, 1977, Pat. No. 4,066,773, which is a continuation-in-part of Ser. No. 653,217, Jan. 28, 1976, Pat. No. 4,055,651, which is a continuation-in-part of Ser. No. 713,486, Aug. 11, 1976, Pat. No. 4,073,914, which is a continuation-in-part of Ser. No. 671,436, Mar. 29, 1976, Pat. No. 4,066,758, which is a continuation-in-part of Ser. No. 703,704, Aug. 8, 1976, Pat. No. 4,069,323, Division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Jun. 7, 1977, Ser. No. 804,368

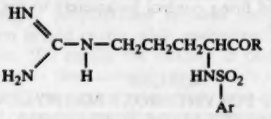
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Jan. 3, 1995, has been disclaimed.

Int. Cl.[2] A61K *31/51*; C07D *211/16, 117/12*

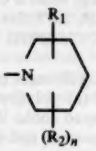
U.S. Cl. 424—247 **5 Claims**

1. An N[2]-arylsulfonyl-L-argininamide having the formula (I):



(I)

or a pharmaceutically acceptable salt thereof, wherein R is



wherein R_1 is $-COOR_3$ wherein R_3 *is hydrogen,* C_1–C_{10} alkyl, C_6–C_{10} aryl, C_7–Chd **12** aralkyl or 5-indanyl; each R_2 independently is hydrogen, C_1–C_{10} alkyl, phenyl, C_1–C_5 alkoxy, C_2–C_6 alkoxycarbonyl, or carboxy; n is an integer of 1 to 4, R_1 is substituted into the piperidine ring at the 2 or 3 position; and R_2 is substituted into the piperidine ring at the 2, 3, 4, 5 or 6 position;

and Ar is naphthyl substituted with at least one substituent selected from the group consisting of halo, nitrom cyano, hydroxy, C_1–C_{10} alkyl and C_2–c_{20} dialkylamino, and at least one substituent selected from the group consisting of C_1–C_{10} alkoxy, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{10} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy, or mixtures thereof; naphthyl substituted with at least one C_1–C_5 alkoxy and at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl op-

tionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof;

naphthyl substituted with at least one substituent selected from the group consisting of sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof;

5,6,7,8-tetrahydronaphthyl substituted with at least one substituent selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof;

a C_9–C_{16} cycloalkylphenyl, C_{10}–C_{18} cycloalkylalkylphenyl, C_9–C_{16} cycloalkoxyphenyl, C_9–C_{16} cycloalkylthiophenyl, C_7–C_{12} aralkyl, 9,10-dihydroanthryl, 5,6,7,8-tetrahydroanthryl, 9,10-dihydrophenanthryl, 1,2,3,4,5,6,7,8-octahydrophenanthryl, indenyl, indanyl, fluorenyl, acenaphthenyl, phenylthiophenyl, 1,2-methylenedioxphenyl, 1,2-ethylenedioxyphenyl, chromanyl, isochromanyl, 2,3-dihydrobenzofuranyl, 1,3-dihydroisobenzofuranyl, 2,3-ethylenedioxynaphthyl, xanthenyl, thioxanthenyl, 1,2-trimethylenedioxyphenyl, 2H-chromenyl, 3,4-dehydro-1-isochromanyl, 4H-chromenyl, indolinyl, isoindolinyl, 1,2,3,4-tetrahydroquinolyl or 1,2,3,4-tetrahydroisoquinolyl group, any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10}, N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl, oxo and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof; a naphthoquinonyl, anthryl phenanthryl, pentalenyl, heptalenyl, azulenyl, biphenylenyl, as-indacenyl, s-indacenyl, acenaphthylenyl, phenylcarbonylphenyl, phenoxyphenyl, benzofuranyl, isobenzofuranyl, benzo(b)thienyl, isobenzothienyl, oxanthrenyl, thianthrenyl, dibenzofuranyl, dibenzothienyl, phenoxathiinyl, indolyl, 1H-indazolyl, quinolyl, isoquinolyl, phthalazinyl, 1,8-naphthyridinyl, quinoxalinyl, quinazolinyl, cinnolinyl, carbazolyl, acridinyl, phenazinyl, phenothiazinyl, phenoxazinyl or benzimidazolyl group, any of which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxyalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof, a phenyl which is unsubstituted or substituted with one or more groups selected from the group consisting of halo, nitro, cyano, hydroxy, C_1–C_{10} alkyl, C_1–C_{10} alkoxy, C_2–C_{20} dialkylamino, sulfoamino, carbamoyl, C_3–C_{10} N,N-dialkylcarbamoyl, amino, C_1–C_{10} alkylamino, mercapto, C_1–C_{10} alkylthio, C_7–C_{12} aralkyl, carboxyl, C_2–C_{10} alkoxycarbonyl, C_2–C_{10} carboxylalkyl, C_1–C_{10} acylamino, C_2–C_{10} alkylcarbonyl, C_1–C_{10} hydroxyalkyl, C_1–C_{10} haloalkyl and phenyl optionally substituted with at least one hydroxy, C_1–C_5 alkoxy or mixtures thereof.

4. A method of inhibiting activity and suppressing activation of thrombin in vivo which comprises administering to a mammal a pharmaceuticaly effective amount of a compound of claim 1.

4,131,674

NAPHTYRIDINE DERIVATIVES

Claude Cotrel, Paris; Cornel Crisan, Sceaux; Claude Jeanmart, Brunoy, and André Léger, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

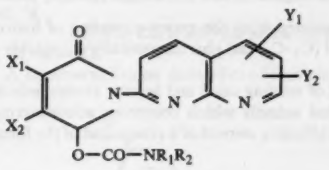
Division of Ser. No. 673,868, Apr. 5, 1976. This application Oct. 19, 1977, Ser. No. 843,369

Claims priority, application France, Apr. 7, 1975, 75 10756; Feb. 11, 1976, 76 03773; Feb. 11, 1976, 76 03774

Int. Cl.[2] C07D *471/04;* A61K *31/535*

U.S. Cl. 424—248.54 **6 Claims**

1. A heterocyclic compound of the formula:



wherein the pyrroline ring and the symbols X_1 and X_2 together form an isoindoline nucleus or an isoindoline nucleus substituted by one or two atoms or radicals selected from halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, nitro and trifluoromethyl, the symbols Y_1 and Y_2 each represent hydrogen, halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, or cyano, and the symbols R_1 and R_2 together with the nitrogen atom to which they are attached form a morpholino ring, and when appropriate non-toxic pharmaceutically acceptable acid addition salts thereof.

6. Tranquilliser, hypnotic, anti-convulsant and anti-spasmodic pharmaceutical compositions which comprise, as an active ingredient, an effective amount of a heterocyclic compound as claimed in claim 1, or — when appropriate — a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutical carrier.

4,131,675

USE OF COMBINATIONS OF L-DOPA WITH TRAZODONE AND L-DOPA WITH ETOPERIDONE IN PARKINSONISM

Bruno Silvestrini, Rome, Italy, assignor to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A., Rome, Italy

Filed Feb. 9, 1978, Ser. No. 876,383

Int. Cl.[2] A61K *31/195, 31/495*

U.S. Cl. 424—250 **4 Claims**

1. A method of treatment of Parkinsonism comprising administering to a patient a combination of trazodone with L-DOPA or etoperidone with L-DOPA at a daily oral dose of 100 to 200 mg of trazodone or etoperidone and a daily dose of 2 to 4 g of L-DOPA substantially in a ratio of 1 part of trazodone or etoperidone for 12 to 25 parts of L-DOPA.

4,131,676

2,6-BIS(1-MORPHOLINOALKYLIDENEAMINO)ANTHRAQUINONES AS ANTI-AMEBIC AGENTS

Stanley A. Lang, Jr., Stoney Point; Paul F. Fabio, Pearl River; Yang-I Lin, Nanuet; Keith C Murdock, and Thomas L. Fields, both of Pear River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 771,880, Feb. 25, 1977, abandoned, which is a continuation-in-part of Ser. No. 699,816, Jun. 24, 1976, abandoned, which is a division of Ser. No. 606,805, Aug. 22, 1975, abandoned. This application Feb. 6, 1978, Ser. No. 875,481

Int. Cl.[2] C07D *295/00;* A61K *31/535*

U.S. Cl. 424—248.56 **6 Claims**

1. A compound of the formula:

wherein R is selected from the group consisting of hydrogen and lower alkyl (C_1–C_2) and pharmaceutically acceptable salts thereof.

4. A method of treating cecal and hepatic amebic infections in warm-blooded animals which comprises administering to said animals an effective amount of a compound of the formula:

wherein R_n is selected from the group consisting of hydrogen and lower alkyl (C_1–C_2) and pharmaceutically acceptable salts thereof.

4,131,677

ANTI-INFLAMMATORY OXAZOLO [5,4-b]PYRIDINES

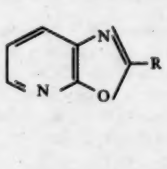
Tsung-Ying Shen, Westfield; Robert L. Clark, Woodbridge; Arsenio A. Pessolano, Colonia; Bruce E. Witzel, Westfield, and Thomas J. Lanza, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 574,173, May 2, 1975, Pat. No. 4,038,396, which is a continuation-in-part of Ser. No. 552,018, Feb. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 409,504, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 262,898, Jun. 14, 1972, abandoned. This application Apr. 27, 1977, Ser. No. 791,634

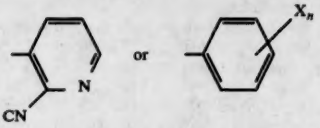
Int. Cl.[2] A61K *31/44;* C07D *491/02*

U.S. Cl. 424—256 **9 Claims**

1. A compound of the structural formula:

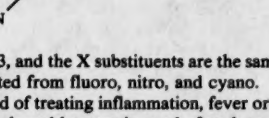


wherein R is



where n is 1–3, and the X substituents are the same or different and are selected from fluoro, nitro, and cyano.

7. A method of treating inflammation, fever or pain in warm blooded animals and humans in need of such treatment which comprises administration of an effective amount of a compound of structural formula:



wherein n is an integer from 1 to 2 and X is the same of different and is halo, trifluoromethyl, lower alkoxy, lower alkyl, nitro or cyano.

4,131,678

URAPIDIL/FUROSEMIDE COMPOUNDS, COMPOSITIONS AND USE

Hermann Amschler, Radolfzell; Kurt Klemm, Allensbach, and Gerhard Ludwig, Constance, all of Germany, assignors to BYK Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

Filed Feb. 9, 1977, Ser. No. 767,214

Claims priority, application Luxembourg, Feb. 9, 1976, 74319

Int. Cl.[2] A61K *31/505;* C07D *405/00*

U.S. Cl. 424—251 **15 Claims**

1. A first component which, in free-base form, is urapidil in combination with a second component which, in free form, is furosemide; the proportion of the second component being sufficient to increase the effectiveness of the first as a hypotensive agent and the combination of the two components being physiologically active and pharmacologically-acceptable.

8. A blood-pressure reducing medicament for subjects afflicted with hypertension and which comprises an effective concentration of a combination according to claim 1 and suitable diluent or excipient.

4,131,679

SUBSTITUTED 4-HYDROXY PYRIDONES

Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

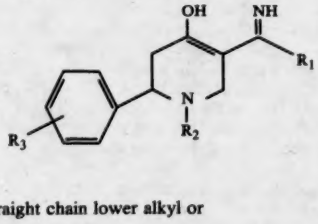
Filed Jul. 26, 1977, Ser. No. 819,006

The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/44;* C07D *211/74*

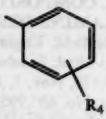
U.S. Cl. 424—263 **7 Claims**

1. A compound of the formula



where

R_1 is straight chain lower alkyl or



where

R_4 is hydrogen or halo having an atomic weight of about 19 to 36, and

R_2 is straight chain lower alkyl, and

R_3 is hydrogen or halo as defined above,

or a pharmaceutically acceptable salt thereof.

7. A pharmaceutical composition for use in the treatment of muscle spasms which comprises a muscle-relaxant effective amount of a compound of claim 1 and a pharmaceutically acceptable diluent or carrier therefor.

4,131,680
HYPOTENSIVE SULPHONAMIDOPIPERIDYL INDOLES

John L. Archibald, Windsor, and John L. Jackson, Royston, both of England, assignors to John Wyeth & Brother Ltd., Taplow, England

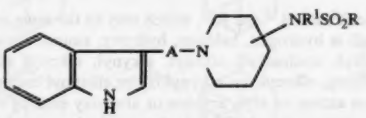
Division of Ser. No. 634,567, Nov. 24, 1975, Pat. No. 4,034,098. This application Sep. 23, 1976, Ser. No. 726,086

Claims priority, application United Kingdom, Dec. 11, 1974, 53643/74

Int. Cl.² A61K *31/445;* C07D *401/06*

U.S. Cl. 424—267 **5 Claims**

1. A compound having the general formula:



or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof, wherein R represents a phenyl radical which may be substituted by halogen, lower alkyl, lower alkoxy or hydroxy; R^1 represents hydrogen or lower alkyl, and A represents lower alkylene, oxo lower alkylene or hydroxy lower alkylene.

5. A hypotensive composition comprising a therapeutically effective amount of a compound as claimed in claim 1 or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof together with a pharmaceutically acceptable carrier.

4,131,681
ANTIALLERGIC METHOD

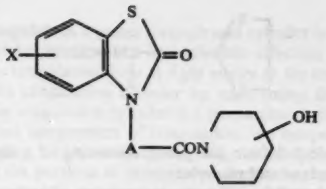
Toshiyuki Takashima, Nagaokakyo, Japan, assignor to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Jul. 27, 1977, Ser. No. 819,555

Int. Cl.² A61K *31/44*

U.S. Cl. 424—267 **5 Claims**

1. A method for treating allergic diseases in mammals which comprises administering an antiallergic amount of a compound of the formula:



wherein A is lower alkylene and X is halogen, to said mammals.

4,131,682
HETEROARYL KETONE DERIVATIVES

Delme Evans, Chalfont St. Peter; John C. Saunders, Maidenhead, and William R. N. Williamson, Slough, all of England, assignors to Lilly Industries Limited, London, England

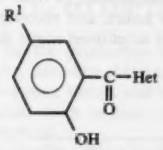
Filed Oct. 11, 1977, Ser. No. 840,883

Claims priority, application United Kingdom, Oct. 14, 1976, 42684/76

Int. Cl.² C07D *333/10;* A61K *31/38*

U.S. Cl. 424—275 **7 Claims**

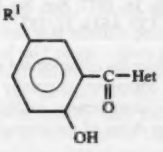
1. A heteroaryl ketone derivative of formula



(I)

wherein R^1 is C_{1-4} alkyl and Het is a heteroaryl group selected from thienyl and thienyl substituted by from one to three groups selected from halogen and C_{1-4} alkyl, or a pharmaceutically acceptable salt thereof, provided that when Het is 2-thienyl, R^1 is C_{2-4} alkyl.

6. A pharmaceutical formulation consisting essentially of a therapeutically effectaive amount of an active ingredient being a compound of formula (I)



(I)

where R^1 is C_{1-4} alkyl and Het is a heteroaryl group selected from thienyl and thienyl substituted by from one to three groups selected from halogen and C_{1-4} alkyl, or a pharmaceutically acceptable salt thereof; associated with a pharmaceutically acceptable carrier therefor.

4,131,683
ω-(1,3-DITHIOLAN-2-IMINO) SUBSTITUTED ACETIC ACIDS

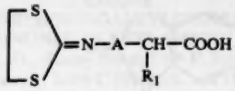
Boyd L. Harrison, and Joseph E. Dolfini, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed May 12, 1978, Ser. No. 905,278

Int. Cl.² A61K *31/385;* C07D *339/06*

U.S. Cl. 424—277 **12 Claims**

1. An ω-(1,3-dithiolan-2-imino) substituted acetic acid having the formula

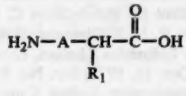


wherein

A is selected from the group consisting of a sigma bond, phenylene and phenylenethio;

R_1 is selected from the group consisting of hydrogen, lower alkyl having 1 to 4 carbon atoms, phenyl, amino, hydroxy, sulfo and carboxy; and the pharmaceutically acceptable salts thereof.

7. A process for preparing a compound of claim 1 which comprises reacting an ω-amino substituted acetic acid having the formula



or a pharmaceutically acceptable salt thereof, with S-methyl 1,3-dithiolane-2-thione iodide, in a solvent selected from the group consisting of water, dimethylformamide, diethyl ether, tetrahydrofuran, acetonitrile, dioxane, methanol and aqueous solutions thereof, at a temperature of from 1° to 50° C. for a period of from 1 to 24 hours, and recovering the resulting ω-(1,3-dithiolan-2-imino) substituted acetic acid therefrom.

4,131,684

COMPLEMENT INHIBITORS

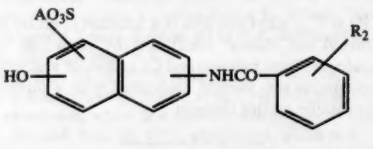
Seymour Bernstein, and Milton D. Heller, both of New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 684,601, May 10, 1976, abandoned. This application Sep. 14, 1977, Ser. No. 833,319

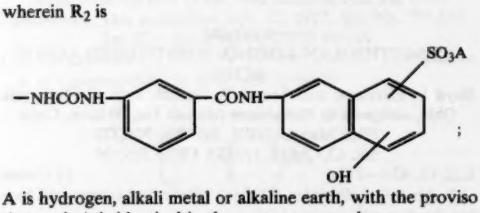
Int. Cl.[2] **A61K** *31/185*

U.S. Cl. 424—315 **2 Claims**

1. A method of inhibiting the complement system in a warm-blooded animal which comprises internally administering to said animal an effective complement inhibiting amount of a compound selected from those of the formula:



wherein R_2 is



A is hydrogen, alkali metal or alkaline earth, with the proviso that each A is identical in the same compound.

4,131,685

PHARMACEUTICAL COMPOSITIONS AND USES OF ALKANOLAMINE DERIVATIVES

Leslie H. Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

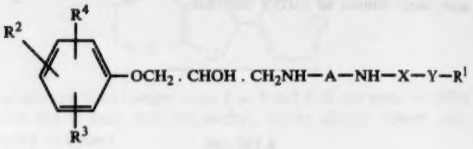
Division of Ser. No. 738,173, Nov. 2, 1976, Pat. No. 4,083,992, which is a division of Ser. No. 607,995, Aug. 26, 1975, Pat. No. 4,010,189, which is a division of Ser. No. 421,669, Dec. 4, 1973, Pat. No. 3,928,412. This application Feb. 23, 1978, Ser. No. 880,495

Claims priority, application United Kingdom, Dec. 15, 1972, 5790/72; Sep. 17, 1973, 43478/73

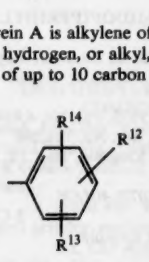
Int. Cl.[2] **A61K** *31/17, 31/275*

U.S. Cl. 424—322 **10 Claims**

1. A pharmaceutical composition comprising as active ingredient an effective amount of at least one alkanolamine selected from compounds of the formula:



wherein A is alkylene of from 2 to 12 carbon atoms, wherein R^1 is hydrogen, or alkyl, halogenoalkyl, alkenyl or cycloalkyl each of up to 10 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, alkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or aralkoxy each of up to 12 carbon atoms; wherein R^4 is hydrogen, hydroxy or hydroxymethyl or aralkoxy of up to 12 carbon atoms; wherein R^{14} is hydrogen, amino or dialkylamino of up to 12 carbon atoms; wherein X is carbonyl (—CO—) and wherein Y is imino (—NH—), or alkylimino of up to 6 carbon atoms and the acid-addition salts thereof, in association with a pharmaceutically-acceptable diluent or carrier therefor.

4,131,686

NOVEL BENZYLALCOHOL DERIVATIVES AND PROCESSES FOR PREPARING THE SAME

Muneyoshi Ikezaki, Ageo; Yashushi Okazaki, Tokyo; Nobuo Ito, Tokyo; Masao Hoshiyama, Tokyo; Taku Nagao, Ageo, and Hiromichi Nakajima, Yono, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

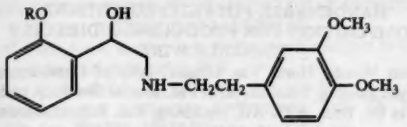
Filed Dec. 6, 1976, Ser. No. 747,898

Claims priority, application Japan, Dec. 11, 1975, 50/148145; Feb. 12, 1976, 51/14668

Int. Cl.[2] **A61K** *31/135;* **C07C** *91/34*

U.S. Cl. 424—330 **8 Claims**

1. A compound of the formula:



wherein R is a lower alkyl group having 1–4 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition consisting essentially of a pharmaceutically acceptable excipient and the compound of claim 1, said composition capable of providing a decrease in blood sugar when administered to a warm blooded animal.

4,131,687

FLAVORING WITH TERPENYL ETHERS

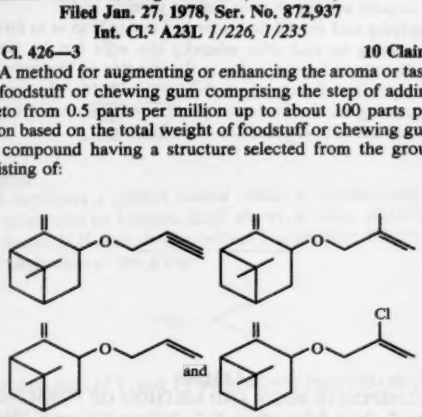
Cynthia J. Mussinan, Bricktown; Braja D. Mookherjee, Holmdel; Manfred H. Vock, Locust; Frederick L. Schmitt, Holmdel, all of N.J.; Edward J. Shuster, Brooklyn, N.Y.; James M. Sanders, Eatontown, N.J.; Bette M. Light, Highlands, N.J., and Edward J. Granda, Englishtown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 27, 1978, Ser. No. 872,937

Int. Cl.[2] A23L *1/226, 1/235*

U.S. Cl. 426—3 **10 Claims**

1. A method for augmenting or enhancing the aroma or taste of a foodstuff or chewing gum comprising the step of adding thereto from 0.5 parts per million up to about 100 parts per million based on the total weight of foodstuff or chewing gum of a compound having a structure selected from the group consisting of:



4,131,688

CONTINUOUS MANUFACTURE OF CHEESE

Gérard Grosclaude, Neauphle le Vieux; Jean Regnier, Issy les Moulineaux, and Marcel Cavarroc, Velizy, all of France, assignors to Institut National de la Recherche Agronomique, Paris, France

Filed Oct. 4, 1976, Ser. No. 729,072

Claims priority, application France, Oct. 3, 1975, 75 30362

Int. Cl.[2] A23C *19/02*

U.S. Cl. 426—40 **8 Claims**

1. A process for the manufacture of cheese comprising the steps of: ultrafiltrating milk or a milk product capable of transformation into cheese until a retentate has been obtained whose solid content is about that of the cheese to be made; adding additional constituents to said retentate to obtain a liquid mixture whose solids content and fat to solids ratio are substantially those of the desired cheese; continuously intimately mixing the mixture with rennet and adjusting the temperature of the resulting mixture so that it is higher than the selected temperature of coagulation; continuously introducing the mixture whose temperature is higher than the selected coagulation temperature into an elongate coagulation cylinder having a smooth-walled interior and an interior cross section having substantially the cross section of the cheese being produced; controlling the rate of flow of the mixture being introduced into said cylinder so that the flow of mixture as it progresses through the cylinder is laminar at all points; causing said mixture to coagulate as it passes through said cylinder in the direction of the longitudinal axis thereof while effecting a substantilly plane coagulation front at right angles to the longitudinal axis of the coagulation cylinder by maintaining the interior wall of the coagulation cylinder at a temperature below that of the selected temperature of coagulation, the temperatures of the incoming mixture and of the coagulation cylinder being such that the portions of the mixture nearer the center of the cylinder coagulate more quickly than the portions adjacent to the interior wall; cutting slices of curd from said coagulate leaving the coagulation cylinder at the outlet of the coagulation cylinder and transferring the slices of curd having substantially the composition and ultimate shape of the cheese produced directly to a ripening station.

4,131,689

PROCESS FOR THE PRODUCTION OF DRIED FOOD PRODUCTS

Gerhard Wilke, Holderlinweg 1, Heidelberg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 312,985, Dec. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 55,622, Jul. 16, 1970, abandoned. This application Mar. 24, 1977, Ser. No. 780,914

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1969, 1936465

Int. Cl.[2] A23L *1/216*

U.S. Cl. 426—242 **14 Claims**

1. A process for the production of dried food products having an irregular, flake-like shape and a thin film of horny, dried-out glued together starch, and which are expandable in water after an initial delay to form a dumpling, said process comprising the steps of:

a. forming individually distinct particles from an ungelatinized base mixture containing material selected from the group consisting of potatoes, and mixtures of starch based products and albumin;

b. adding water to said individually distinct particles and kneading the same for a period of time sufficient to form an inhomogeneous mixture wherein the integrity of said distinct particles is preserved;

c. forming said mixture into a film by subjecting said inhomogeneous mixture to single rollers arranged one behind the other in series and operating at differential speeds, each succeeding roller moving faster than the preceding roller, such that said mixture passes from part of the surface of one of said single rollers to part of the surface of another of said single rollers adjacent thereto thereby pressurizing the surfaces of said film to produce outer layers of greater density than the remainder of said film and imparting greater fibrous characteristics to said remainder of said film than to said outer layers thereof, said differential speeds of the rollers causing a shearing effect on said mixture so that the mass of film remains with an irregular structure;

d. removing said film from the last roller;

e. drying said film to further increase the density of said outer layers; and

f. separating the dried film into flake-like particles.

4,131,690

METHOD OF POWDER COATING AN INSULATED ELECTRICAL CONDUCTOR

John A. Jukes, Pierre Fonds, and Philip A. McGettigan, Montreal, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Filed May 5, 1975, Ser. No. 574,608

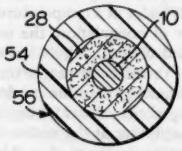
Int. Cl.[2] B05D *5/00, 5/12*

U.S. Cl. 427—32 **11 Claims**

1. A method of producing an insulated electrical conductor comprising the steps of:

electrostatically depositing a powdered polymeric material

onto a wire conductor coated with an annular sheath of electrically insulating heat resistant fibrous material.



applying heat externally to the conductor to fuse the polymeric material to form an uniform outer layer of polymeric material and

cooling the polymer coated conductor.

4,131,691

COATING A SUBSTRATE BY GLOW DISCHARGE GRAFT POLYMERIZATION

John R. Morley, Oakland, Calif., and Ralph E. Howe, Cold Spring Harbor, N.Y., assignors to Surface Activation Corporation, Syosset, N.Y.

Filed Sep. 22, 1977, Ser. No. 835,657
Int. Cl.² B05D *3/06*
U.S. Cl. 427—41 **5 Claims**

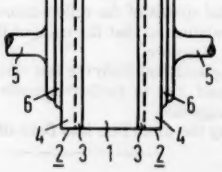
1. A method of graft polymerizing a monomer on a substrate, comprising passing a substrate through a zone of electrical glow discharge plasma in a gaseous medium comprising at least about 25%, by weight, of water vapor, based on the total weight of the gaseous medium, thereby exposing said substrate to said plasma in said zone to generate free radical sites on said substrate, and subsequently exposing the substrate containing said free radical sites to an ethylenically unsaturated monomer to form a graft polymer thereof on said substrate.

4,131,692

METHOD FOR MAKING CERAMIC ELECTRIC RESISTOR

Baerbel Seebacher, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 592,524, Jul. 2, 1975, abandoned. This application Aug. 11, 1976, Ser. No. 713,355
Claims priority, application Fed. Rep. of Germany, Jul. 11, 1974, 2433458
Int. Cl.² C23C *3/02*
U.S. Cl. 427—101 **7 Claims**



1. A process for the production of a ceramic electric resistor comprising:

the steps of obtaining a ceramic body which consists of material having a Peronskite structure with semiconducting doping with alien-lattice ions, applying a palladium (II)-chloride solution to the surface of the ceramic body at points to be contacted, stoving in the palladium (II)-chloride solution at temperatures between 300° to 500° C. after it has been applied to the ceramic body, currentless nickel-plating the resulting palladium (II)-chloride layer to produce a second layer and tempering the resulting resistor.

4,131,693

HARDENABLE POLYESTERURETHANE COMPOSITION FOR PRODUCING A DIRECTLY TINNABLE WIRE

Hartmut Wendt; Horst Von Grüner, both of Hamburg, and Harald Janssen, Reinbek, all of Fed. Rep. of Germany, assignors to Dr. Beck & Co AG, Hamburg, Fed. Rep. of Germany

Filed Jul. 18, 1977, Ser. No. 816,775
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632047
Int. Cl.² B05D *5/12, 3/02*
U.S. Cl. 427—117 **8 Claims**

1. A process for producing a coating for directly tinnable wire, comprising the steps of

forming a hardenable polyester urethane having a urethane equivalent (NHCOO-) weight of 150 – 850 by reacting at 100 – 200° C (A) a polyester having an excess of alcohol groups relative to the acid groups so as to provide at least two free hydroxyl groups with an aromatic polyisocyanate containing at least two free isocyanates end groups so as to form a polyurethane through reaction of said hydroxyl groups with said isocyanate end groups,

dissolving the formed polyester urethane in a phenol-free organic solvent so as to make a varnish; and

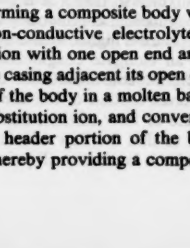
applying said varnish to a wire and curing it so as to form a coating on said wire whereby the wire can be tinned directly and speedily due to the fact that on immersion of a portion of such wire into a bath of solder the varnish coating on the immersed portion will become removed and the wire exposed for direct tinning.

4,131,694

COMPOSITE BODY AND METHOD OF FORMING

Bruce S. Dunn, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 852,242, Nov. 17, 1977. This application Mar. 20, 1978, Ser. No. 890,595
Int. Cl.² B05D *5/12*; H01M *6/20*
U.S. Cl. 427—126 **3 Claims**



1. A method of forming a composite body which comprises providing a solid ion-conductive electrolyte material body having a casing portion with one open end and a header portion integral with the casing adjacent its open end, submerging the header portion of the body in a molten bath of a salt containing a divalent substitution ion, and converting the surface portion of only the header portion of the body to an ion-insulating material thereby providing a composite body.

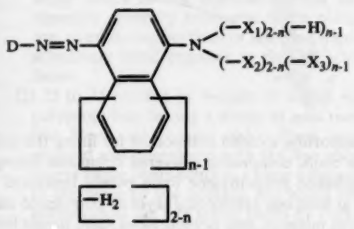
4,131,695

AZO COLOR FORMER CONTAINING HEAT-SENSITIVE RECORDING MATERIAL

Jean C. Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

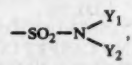
Filed Feb. 23, 1976, Ser. No. 660,596
Claims priority, application Switzerland, Feb. 27, 1975, 2522/75; Aug. 8, 1975, 10378/75
Int. Cl.² B41M 5/18, 5/26; C09B 29/06, 29/08
U.S. Cl. 427—148 11 Claims

1. In a heat-sensitive recording material which contains in at least one fusible film-forming binder layer on a substrate, at least one color former dispersed or dissolved therein and at least one electron acceptor substance as a color developer, said electron acceptor substance being a solid organic or inorganic Bronsted acid or inorganic acid salt with a pKa value value of 4 or lower than 4, the improvement wherein the color former is an azo compound of the formula



wherein

D represents a phenyl radical which is unsubstituted or substituted by halogen, alkyl, alkoxy, aryloxy, alkoxycarbonyl, N,N-dialkylaminocarbonyl, acylamino, N-acyl-N-alkylamino or the group



wherein each of Y_1 and Y_2 independently represents alkyl or aryl,

X_1 represents hydrogen or alkyl,

X_2 represents alkyl, cyanoalkyl or arylmethyl,

X_3 represents alkyl or aryl, and

N is 1 or 2.

4,131,696

CONTACT LENS TREATMENT

William Covington, West Cornwall, Conn., assignor to Burton, Parsons and Company, Inc., Washington, D.C.

Filed Oct. 19, 1977, Ser. No. 843,554
Int. Cl.² G02C 7/04; G02B 1/10
U.S. Cl. 427—164 9 Claims

1. A method for increasing the wearing comfort of hard contact lenses which comprises contacting the lens surfaces with an aqueous colloidal suspension of a physiologically inert inorganic hydrous oxide thereby rendering said lens surfaces wettable by lacrimal fluids, rinsing the lenses to remove any non-adhering colloidal particles and inserting the lenses over the cornea of the eye.

4,131,697

METHOD OF COATING CARBON FILAMENTS WITH SILICON CARBIDE

Jean-Louis R. G. Randon, Brettigny-sur-Orge, and Georges S. Slama, Creteil, both of France, assignors to Association pour la Recherches et le Developpement des Methodes et Processus Industriels, France

Continuation of Ser. No. 479,096, Jun. 13, 1974. This application Sep. 12, 1977, Ser. No. 832,611
Claims priority, application France, Jun. 15, 1973, 73 21814
Int. Cl.² C23C 11/00
U.S. Cl. 427—249 3 Claims

1. A method of coating a carbon filament having a thickness of less than 50 microns with silicon carbide, which comprises passing the carbon filament heated by the Joule effect to a temperature of about 1350° C, into a first reactor containing gaseous silicon tetrachloride and hydrogen, the dwell time of the filament in the first reactor being less than 30 seconds, thereby forming a layer of silicon carbide having a thickness of less than 0.2 micron, and then passing the filament heated to a temperature of at least 1100° C into a second reactor containing methyltrichlorosilane and hydrogen thereby producing a silicon carbide coating on the filament of at least ten microns.

4,131,698

PRETREATMENT OF POLYVINYL CHLORIDE PLASTICS FOR ELECTROLESS DEPOSITION

Cheryl A. Deckert, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 16, 1977, Ser. No. 861,453
Int. Cl.² C23C 3/02
U.S. Cl. 427—304 9 Claims

1. A process for pretreating a polyvinyl chloride plastic prior to electroless metal deposition which comprises immersing the polyvinyl chloride plastic in a solution consisting of an alkali metal hydroxide in a concentration from about 10 grams to about 400 grams per liter of solution, wherein said solution comprises about 5% to about 30% by volume of a water soluble mono-, di-, or polyhydric alcohol and about 70% to about 95% by volume of water.

4,131,699

METHOD OF PREPARATION AND USE OF ELECTROLESS PLATING CATALYSTS

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 625,326, Oct. 23, 1975, Pat. No. 4,048,354. This application Aug. 1, 1977, Ser. No. 820,904
The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.
Int. Cl.² C23C 3/02
U.S. Cl. 427—306 51 Claims

1. A process for electroless or chemical plating onto a non-conductor substrate comprises the step of contacting said substrate in an activated colloidal dispersion wherein said colloidal dispersion comprises a metal capable of electroless or chemical plating initiation and wherein said activated colloidal dispersion is derived from the admixing of a weakly active colloidal dispersion of said metal or alloy or compound of said metal containing a colloid stabilizer with a reactivity modifier thereby increasing the activity of said weakly active colloidal dispersion and wherein said colloid stabilizer and said reactivity modifier are different materials and further wherein said reactivity modifier is inherently a colloid stabilizer and thus said activated colloidal dispersion comprises of at least two colloidal stabilizers.

4,131,700

COMPOSITION OF MATTER FOR TREATING A CLOSED CELL FOAM SUBSTRATE

Richard J. Guglielmo, Sr., Lambs La., Cresskill, N.J. 07626

Filed Jul. 12, 1976, Ser. No. 704,307
Int. Cl.[2] B05D *3/00, 3/12*
U.S. Cl. 427—322 **12 Claims**

8. A process for treating a foam material to provide a vinyl film thereon which comprises coating said foam material with a vinyl coating solution formed by admixing a vinyl copolymer and plasticizer therefor in a solvent system having a flash temperature above about 150° F. and including a chlorinated hydrocarbon solvent and a vinyl solvating solvent and the reafter applying said composition of matter to said foam material at a temperature of from 50° to about 140° F.

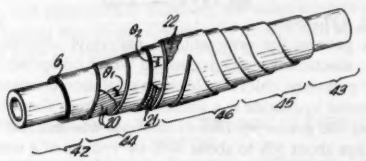
9. The process as defined in claim 8 and including the step of pretreating said foam material to clean the surface thereof.

4,131,701

COMPOSITE TUBULAR ELEMENTS

Richard L. VanAuken, Bridgewater, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 801,028, May 27, 1977. This application Dec. 2, 1977, Ser. No. 856,615
Int. Cl.[2] B32B *5/12*; F16C *1/02*
U.S. Cl. 428—36 **8 Claims**



1. A tubular composite structure for transmitting substantial torsion and bending loads comprising:

a tubular metal core;

a layer of structural metal adhesive on the exterior surface of the metal core;

a plurality of superimposed layers of resin-impregnated unidirectional continuous reinforcing fibers circumferentially wrapped around said tubular metal core, each layer of said resin impregnated fibers having the fibers oriented at an angle of between about 5° to 20° with respect to the longitudinal axis of the metal core and in opposite angular orientation with respect to the next preceding layer of said resin-impregnated fibers;

a layer of woven fiberglass cloth interposed between each superimposed layer of said resin-impregnated reinforcing fibers; and

a layer of woven fiberglass cloth interposed between said layer of structural metal adhesive and a said superimposed layer of said resin-impregnated reinforcing fibers;

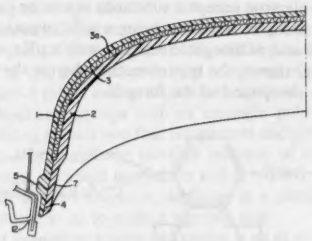
each of said plurality of superimposed layers of resin-impregnated unidirectional continuous reinforcing fibers and said layers of woven fiberglass cloth being shaped such that when circumferentially wrapped around the said tubular metal core the thickness of said layers wrapped around said core will vary along the length of the tubular structure with the maximum wall thickness being substantially at the mid-section of the tubular structure and the minimum thickness being at the first end and the second end of said tubular structure.

4,131,702

SELF-SUPPORTING MOLDED COMPONENT FOR AUTOMOTIVE VEHICLES

Franz W. Alfter, Siegburg; Hans-Ulrich Breitscheidel, Troisdorf; Günter Mecklenburg, Troisdorf-Spich, and Paul Spielau, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Jun. 16, 1977, Ser. No. 807,335
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1976, 7619090[U]
Int. Cl.[2] B32B *1/04, 3/26, 3/28*; B62D *25/06*
U.S. Cl. 428—76 **6 Claims**



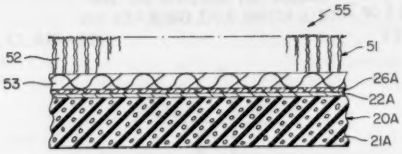
1. A self-supporting molded component for lining the inside of automobile roofs, comprising a layered composite arrangement of crosslinked polyethylene foam panels laminated on both sides to at least one reinforcing layer of corrugated cardboard or carton material, said polyethylene foam panels being arranged so that the reinforcing layer is surrounded on all sides by the polyethylene foam panels and is sealed off against the penetration of mositure.

4,131,703

FIRE-RESISTANT CONSTRUCTION, METHOD OF MAKING SAME, AND CARPET CONSTRUCTION EMPLOYING SAME

Harry C. Voet, Cincinnati, Ohio, assignor to Dayco Corporation, Dayton, Ohio

Filed Feb. 17, 1978, Ser. No. 879,024
Int. Cl.[2] B32B *3/26*
U.S. Cl. 428—95 **24 Claims**



16. In combination: a fire-resistant carpet underlay construction and a carpet disposed on said underlay construction; said carpet having a wear layer and a backing layer with said backing layer adjoining said underlay construction; said underlay construction comprising a cellular layer of compressible resilient elastomeric material and a sheet of metallic foil fixed against said layer; said sheet serving to dissipate heat from any portion of said cellular layer subjected to heat of an ignition source to thereby help provide said construction with its fire-resistant character; said elastomeric material consisting of a foam latex which when subjected to said heat, starts decomposing to initially generate water vapor which helps cool said cellular layer and carpet, releases a flame retardant with further decomposition, and forms a char layer with still further decomposition which helps insulate said cellular layer and carpet from heat while limiting oxygen flow thereto.

4,131,704

NONWOVEN FABRIC COMPRISING NEEDLED AND SELECTIVELY FUSED FINE AND COARSE FILAMENTS HAVING DIFFERING SOFTENING TEMPERATURES WHICH IS USEFUL AS A BACKING IN THE PRODUCTION OF TUFTED MATERIALS

Wayne K. Erickson, and John P. Walters, both of Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 2, 1976, Ser. No. 646,098
Int. Cl.[2] B32B *5/06, 5/08, 5/12;* **D04H** *1/48*
U.S. Cl. 428—95 **10 Claims**

1. A tufted pile fabric comprising:

(a) a primary backing of fine staple fibers and coarse staple fibers including:

(1) 75 to 25 percent by weight of said fine staple fibers of polypropylene having a lower softening temperature than that of said coarse fibers, thereby permitting the selective fusing of fine staple fibers in preference to fusing of coarse staple fibers, said fine staple fibers being randomly oriented in the plane of the backing, said fine staple fibers having portions thereof extending in a direction generally transverse to the plane of the backing, overlapping portions of said fine staple fibers being selectively fused together to provide integrity for the fabric.

(2) 25 to 75 percent by weight of coarse staple fibers of polypropylene having a denier at least twice that of the fine fibers, said coarse staple fibers being randomly oriented and intermixed with the fine staple fibers, and coarse staple fibers being in a plane substantially parallel to the plane of the backing and being retained in the interstices of the fine staple fibers by frictional engagement with the fine staple fibers with a major portion of the length of the coarse staple fibers being free of fusion bonding to thereby allow said coarse staple fibers to move within said interstices; and

(b) tufted yarns piercing said primary backing; and

(c) a secondary backing adhered to said tufted primary backing.

3. A nonwoven fabric comprised of a plurality of different types of staple fibers, said fabric including:

(a) 75 to 25 percent by weight of fine staple fiber of synthetic material randomly oriented in the plane of the fabric with said fine staple fibers having portions thereof extending in a direction generally transverse to the plane of the fabric, overlapping portions of said fine staple fibers being selectively fused together to provide integrity for the fabric;

(b) 25 to 75 percent by weight of coarse staple fibers having a denier of at least twice that of the fine staple fibers, of synthetic material having a higher softening temperature than the softening temperature of the fine staple fibers, thereby permitting the selective fusing of fine staple fibers to fine staple fibers in preference to fusing of coarse staple fibers, said coarse staple fibers being randomly oriented in the plane of the fabric and intermixed with the fine staple fibers, said coarse staple fibers being positioned in a plane substantially parallel to the plane of the fabric and being at least partially retained in the interstices of the fine staple fibers by frictional engagement with the fine staple fibers, said coarse staple fibers have a major portion of their length free of fusion bonding to thereby allow said coarse staple fibers to move within said interstices.

8. A method of making a nonwoven fabric, said method including the steps of:

(a) forming a web of intermixed and randomly oriented fibers of which 75 to 25 percent is fine staple fibers of synthetic material and 25 to 75 weight percent is coarse staple fibers of synthetic material having a denier of at least about twice that of the fine fibers, said coarse fibers having a higher softening temperature than that of the fine fibers;

(b) needling said web with needles having a barb size sufficiently small for selectively needling the fine fibers in preferance to the coarse fibers whereby portions of the fine fibers extend in a direction generally transverse to the plane of the fabric and said coarse fibers are generally parallel to the plane of the fabric; and

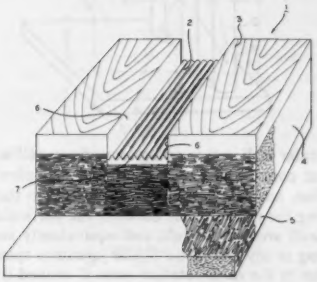
(c) heating the needled web to a temperature sufficient to selectively bond the fine fibers together at overlapping portions thereof in preference to bonding the coarse fibers, with the majority of the length of the coarse fibers being free of fusion bonding and movable within the interstices of the fine fibers and held therein by friction.

4,131,705

STRUCTURAL LAMINATE

Eugene J. Kubinsky, Shelton, Wash., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 6, 1977, Ser. No. 830,471
Int. Cl.[2] B32B *5/12, 5/14;* **B29D** *3/02;* **D04H** *1/16*
U.S. Cl. 428—106 **11 Claims**



1. A structural laminate having a pattern impressed therein comprising

an outer wood face veneer, the grain of which is oriented along a given direction and

at least two plies of particle board, said particle board ply nearest the outer face veneer having a particle orientation along a direction perpendicular to the grain of the face veneer, the other of said particle board plies having a particle orientation along the same direction as said face veneer,

said laminate containing at least one groove therein pressed into the outer surface of the laminate along the direction of the grain during the pressing of said plies into a composite laminate.

9. A process of producing a structural laminate having a pattern impressed therein comprising

forming at least two layers of particles oriented in a direction perpendicular to each other, each of said layers comprising said particles and an adhesive therefor,

placing a wood face veneer adjacent one of said layers of particles, the grain of said wood face veneer being oriented along a direction perpendicular to said adjacent particle layer, and

pressing together under heat and pressure into a composite laminate said particle layers and wood face veneer and, during said pressing operation, impressing at least one groove into the outer surface of said laminate.

4,131,706

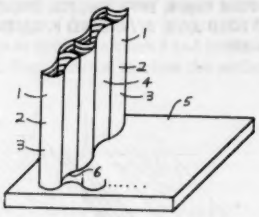
SUNLIGHT ADMITTING HEAT IMPEDING PANEL

Ronald E. Graf, Rte. 3, Box 520, Crozet, Va. 22932

Continuation-in-part of Ser. No. 643,842, Dec. 3, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 752,982
Int. Cl.[2] B32B *3/12, 3/00*
U.S. Cl. 428—116 **4 Claims**

1. A solid structure with a multiplicity of substantially parallel cells in a honeycomb type of configuration which can

deform to accommodate compression and tensile forces due to temperature gradients within the structure, said structure being comprised of interconnecting walls between juncture lines of the walls, the walls being thin enough to be thought of as geometrical surfaces, each juncture line being substantially straight and parallel to every other juncture line, so that the juncture lines may be thought of as straight and parallel, each wall being curved and oriented with respect to the other walls in a recurring symmetrical pattern, with at most one wall running between any pair of juncture lines, each of said cells being comprised of walls each undulating in and out with respect to the interior of the cell, so that any wall in a cell is substantially represented by a single undulating curve when viewed parallel to any juncture line of two walls, and such that



each particular wall in turn going around any cell in one direction is first convex with respect to the cell after leaving a juncture line, and last concave with respect to the cell upon approaching the juncture line between the particular wall and the next wall around the cell, and equivalently such that all walls ending at any and all particular junctures spiral out from the juncture in the same rotation sense if viewed from a good distance along any juncture extended, this configuration thus, in the absence of other rotation factors, causing all the walls to physically rotate in the neighborhood of any juncture in a given rotation sense around the juncture whenever the juncture is under increasing compression, said compression being substantially applied perpendicular to the juncture at all points along the juncture.

4,131,707

STABLE RESIN SOLUTIONS CONTAINING COMPOUNDS HAVING AT LEAST ONE FURYL RADICAL

Abdul-Cader Zahir, Oberwil, and Sigfried Wyler, Dornach, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

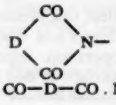
Filed Nov. 8, 1976, Ser. No. 739,877

Claims priority, application Switzerland, Nov. 14, 1975, 14797/75

Int. Cl.[2] B32B 7/00; B05D 3/02

U.S. Cl. 428—251 **14 Claims**

1. In a solution which contains a curable mixture of (1) imide or amide-carboxylic acid which contains in the molecule at least one of the radicals of the formulae



(I)

HO . CO—D—CO . NH— (II)

in which D denotes a divalent radical containing a carbon-carbon double bond, (2) comonomers of said imide or amide-carboxylic acid selected from the group consisting of polyprimary amine, polyhydric phenol, polyhydric alcohol, poly carboxylic acid, alkenylphenol,alkenylphenol ether, and an azo methine, or a mixture of these substances and, optionally, (3) ionic or free-radical polymerization catalysts, the improvement which comprises adding to said solution a compound which contains at least one furyl radical in an amount such that there are 0.05 to 10 equivalent of said compound per 1 equivalent of imide or amide-carboxylic acid.

10. A method of coating for the manufacture of a crosslinked polymer containing imide groups, wherein a substrate, is impregnated or coated with a solution according to claim 1, the solvent is then evaporated and, finally, curing and crosslinking are carried out, at temperatures of between 100° and 300° C.

4,131,708

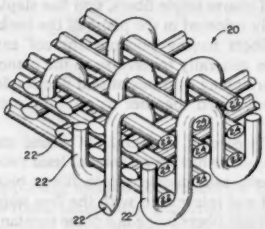
SELECTIVELY MODIFIED CARBON-CARBON COMPOSITES

Peter R. Moores, Sanford, and James E. Shoffner, Kennebunk, both of Me., assignors to Fiber Materials, Inc., Biddeford, Me.

Filed Jul. 27, 1976, Ser. No. 708,929

Int. Cl.[2] D32B 7/00

U.S. Cl. 428—257 **7 Claims**



1. An ablative carbon-composite shaped structure for high temperature thermal protection comprising, in combination:

a carbon-carbon composite reinforced body, and

implants in the form of elongate columns of a refractory metal carbide disposed within said body, said refractory metal carbide implants (I) being (a) substantially aligned parallel with one another axially in the direction of expected thermal flux and (b) positioned at predetermined locations of expected thermal flux through said structure, and (II) having (a) a melting point below the sublimation temperature of the surrounding composite and (b) a thermal explansibility having a force below the strength of the surrounding composite.

4,131,709

ADHESIVE COMPOSITIONS

Erich Schunck, Hochheim, Main; Heinz Schmelzer, Rummelsheim, and Richard Sattelmeyer, Schlangenbad, Georgenborn, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 20, 1976, Ser. No. 752,176

Claims priority, application Fed. Rep. of Germany, Dec. 27, 1975, 2558858

Int. Cl.[2] B22B 7/12

U.S. Cl. 428—261 **10 Claims**

1. An adhesive composition consisting essentially of

I. 100 parts by weight of a block copolymer with at least two polymer blocks (A) and at least one polymer block (B), wherein the polymer blocks (A) comprise non-elastomeric blocks with an average molecular weight of from 2000 to 125,000 derived from an aromatic hydrocarbon substituted by one of the groups consisting of the members monoalkenyl and monoalkylidene and wherein not more than 25% of the original double bonds are hydrogenated, and polymer block (B) is an elastomeric block with an average molecular weight of from 10,000 to 250,000 derived from a conjugated diene, wherein at least 75% of the aliphatic unsaturated bonds are hydrogenated;

II. 10 to 200 parts by weight of at least one cohesion-increasing resin selected from the group consisting of an alkylphenol aldehyde resin, an arylphenol aldehyde resin, a

phenol-colophony-adduct and a rosin-modified phenol aldehyde resin; the components dissolved in at least one solvent.

8. A process of bonding one substrate to another substrate which comprises applying to the surface of either substrate an adhesive composition as claimed in claim 1 and placing the surfaces to be bonded together.

4,131,710
RECORDING MATERIAL CONTAINING ASBESTOS

Güido Dessauer, Dusseldorf-Gerresheim; Kurt Ramlow, Schaffiund; Kurt Riecke, Kempen, and Franz Wirnitzer, Flensburg, all of Fed. Rep. of Germany, assignors to Feldmuhle Aktiengesellschaft, Dusseldorf-Oberkassel, Fed. Rep. of Germany

Filed Jan. 18, 1977, Ser. No. 760,275

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1976, 2601864

Int. Cl.[2] B32B *5/16, 9/06;* **B41M** *5/16*

U.S. Cl. 428—328 **10 Claims**

1. A recording sheet capable of displaying a colored image when contacted under pressure with a substantially colorless member of the group consisting of crystal violet lactone, malachite green lactone, benzoyl leuco methylene blue, and N-phenylleukauramine, said sheet consisting mainly of paper-forming fibrous material, 3 to 30 percent of the weight of said fibrous material being constituted by asbestos fibers uniformly distributed in said sheet, said sheet carrying a surface coating including an amount of a mixture of γ-alumina and precursors of said γ-alumina uniformly distributed in said coating, the amount of said mixture being sufficient to enhance said displaying of a colored image, said precursors being hydrated forms of aluminum oxide capable of being converted substantially completely to γ-alumina when heated from 300° to 1000° C., said mixture containing 1 to 30 percent water volatile at 1000° C.

4,131,711
COATING PROCESS USING DISPERSIONS OF TETRAFLUOROETHYLENE POLYMERS AND POLYETHERSULPHONES AND ARTICLE

Terence E. Attwood, Kimpton, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 786,938, Apr. 12, 1977, abandoned. This application May 8, 1978, Ser. No. 903,660

Claims priority, application United Kingdom, Jan. 25, 1977, 2954/77; Mar. 30, 1977, 13446/77

Int. Cl.[2] B32B *9/04*

U.S. Cl. 428—332 **10 Claims**

1. A process for the production of a coated article comprising applying to the article in a single coating step an aqueous dispersion of a tetrafluoroethylene polymer and a thermoplastic aromatic polyethersulphone in which at least 20% of the end groups of the polymer chain are aromatically bound hydroxyl groups and said polyethersulphone having a reduced viscosity below 0.25, as measured at 25° C. on a solution in dimethyl formamide containing 1 g of polymer in 100 cm^3 of solution, drying the coating, and thereafter baking the coated article in the presence of oxygen at a temperature in the range 420 to 450° C. to achieve a single coating of thickness at least 15 μm.

4,131,712
PROCESS FOR PREPARING POLYAMIDE FROM DIACID-RICH COMPONENT AND DIAMINE-RICH COMPONENT

Jerome W. Sprauer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 10, 1977, Ser. No. 823,326

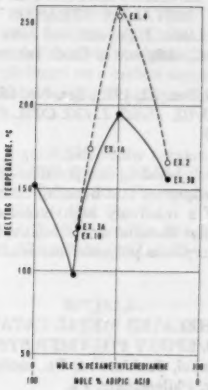
Int. Cl.[2] C08G *69/28*

U.S. Cl. 528—335 **13 Claims**

1. A process for making a high molecular weight, fiber-forming polyamide, said process comprising the following steps:

(1) providing a diacid-rich component prepared by melting together at least one dicarboxylic acid with at least one diamine or with a physical or chemical combination of at least one dicarboxylic acid with at least one diamine in a total diacid to total diamine mole ratio, whether free or chemically combined, of about 1.5:1 to 9:1;

(2) providing a diamine-rich component selected from the group consisting of at least one diamine and a product obtained by melting together at least one diamine with at least one dicarboxylic acid or with a physical or chemical combination of at least one diamine with at least one dicarboxylic acid in a total diamine to total dicarboxylic acid mole ratio, whether free or chemically combined, of at least 1.5:1;



(3) contacting in a melt the diacid-rich component with the diamine-rich component in such proportions that the mole ratio of the total diamine to the total dicarboxylic acid, whether free or chemically combined, is within the range of 0.95 to 1.05 and at sufficiently high temperature to prevent precipitation of solid material; and

(4) heating together the molten components with good agitation to a sufficiently high temperature to cause polycondensation, with formation of a liquid high molecular weight polyamide;

with a proviso that each of dicarboxylic acid and diamine is a polymethylene compound having 6–12 carbon atoms.

4,131,713
LEATHER YARN PRODUCT AND METHOD OF MANUFACTURE

Leslie P. Barta, Murray, Utah, and William M. Alexander, 1835 Elmwood Dr., Hillsborough, Calif. 94010, assignors to William M. Alexander, Hillsborough, Calif.

Continuation-in-part of Ser. No. 467,887, May 8, 1974, abandoned. This application Jun. 17, 1977, Ser. No. 807,361

Int. Cl.[2] C14B *9/00;* **D03D** *15/00*

U.S. Cl. 428—364 **13 Claims**

1. A method of manufacturing a leather yarn having a combination of parameters which enable the yarn to be acceptable for and readily worked by garment knitting machine needlework into a knitted fabric having a soft leather hand, said method comprising,

selecting a leather piece having the softness characteristics of fine garment/dress glove leather and having a weight in the range of 3 oz. to 1½ oz. as measured by a standard leather thickness gauge,

temporarily stiffening the soft leather piece to a sufficient extent to enable a narrow width strand to be continuously machine cut from the periphery of the leather piece without bunching of the leather piece at the point of cutting,

machine cutting a long, continuous, untwisted, leather

strand of substantially uniform width not greater than about 4/32 in. from the periphery of the leather piece,

manipulating and scraping the cut strand to remove loose fibril material which could clog up the mechanisms of knitting machines,

returning the cut leather strand to the softness of the leather piece existing prior to said temporary stiffening, and

winding the leather yarn on spools for subsequent use in machine knitting operations.

8. A leather yarn made by the method defined in claim 1.

4,131,714
MIXTURES OF LINEAR POLYESTERS USED TO COAT METALLIC STRANDS

Joseph Karkoski; Lionel J. Payette, and John D. Shurboff, all of Fort Wayne, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.

Filed Dec. 22, 1975, Ser. No. 643,568
Int. Cl.[2] B32B *15/02, 15/08, 15/20;* **C08L** *67/00;* **H01B** *3/42*
U.S. Cl. 428—379 **8 Claims**

1. A bondable magnet wire comprising a magnet wire having coated thereon a bonding composition exhibiting thermally stable bonding properties said bonding composition comprising a mixture of a relatively high molecular weight linear crystalline polyester material and a relatively high molecular weight linear amorphous polyester material.

4,131,715
USE OF CHELATED METAL CATALYSTS FOR ACID/EPOXY POLYMER SYSTEMS

Lawrence S. Frankel, Jenkintown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jan. 20, 1976, Ser. No. 650,819
Int. Cl.[2] B32B *27/38, 35/00;* **D02G** *3/00*
U.S. Cl. 428—413 **14 Claims**

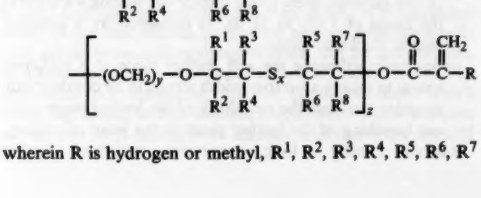
1. An article of manufacture having adhered thereto a cured composition of a linear addition copolymer, containing carboxylic acid groups derived from a mixture of copolymerizable ethylenically unsaturated monomers containing a dicarboxylic acid anhydride or an α,β-ethylenically unsaturated acid, and a resin-forming epoxy compound containing a plurality of epoxide groups, reacted by means of a catalyst, in the amont of 0.04% to 10.0% by weight based on the weight of the addition copolymer, the catalyst being a transition metal chelate stable at ambient temperatures and which decomposes to release the chelated metal when heated to temperatures of above about 100° C, said composition, before curing, being substantially free of volatile solvent.

4,131,716
ACRYLIC ACID ESTERS OF POLYTHIODIALKANOLS AND RELATED COMPOUNDS

Eugene R. Bertozzi, Yardley, Pa., assignor to Thiokol Corporation, Newtown, Pa.

Filed Apr. 28, 1977, Ser. No. 791,756
Int. Cl.[2] C08F *2/50, 4/00*
U.S. Cl. 428—425 **3 Claims**

1. A curable composition which comprises an acrylate terminated polyurethane prepolymer, a photosensitizer, and a compound of the formula

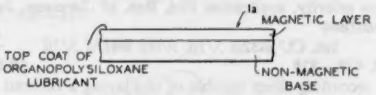


wherein R is hydrogen or methyl, R^1, R^2, R^3, R^4, R^5, R^6, R^7 and R^8 are hydrogen, methyl or ethyl, or each independently is hydrogen, methyl, ethyl, or chloromethyl, x is from about 2 to about 4, y is 0 or an integer of from 1 to 3, and z is 0 or is sufficient to make a molecular weight of about 4000.

4,131,717
MAGNETIC RECORDING MEDIUM

Takayasu Hirano, Tagajyo; Yoshiaki Hisagen, Sendai; Minoru Takamizawa, and Hiroshi Yoshioka, both of Annaka, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 16, 1977, Ser. No. 797,336
Claims priority, application Japan, May 18, 1976, 51-57585
Int. Cl. H01f *10/02*
U.S. Cl. 428—447 **12 Claims**



1. In a magnetic recording medium having a non-magnetic base and a magnetic layer formed thereon containing magnetizable particles dispersed in a resinous binder, the improvement comprising wherein:

said magnetic layer has an organopolysiloxane added into such layer, said organopolysiloxane having an average unit formula:

$$(CH_3)(RO)_n(R'COO)_mSiO_{(3-n-m)/2}$$

where in R is a monovalent hydrocarbon group having from 1 to 5 carbon atoms, R′ is an aliphatic monovalent hydrocarbon group having from 7 to 17 carbon atoms; n is zero or a positive number; m is a positive number with the proviso that n + m is less than 3 and the number of Si atoms in a molecule of such organopolysiloxane ranges from 2 to 8; said organopolysiloxane being present within said magnetic layer in an amount ranging from about 0.5 to 6 parts by weight per 100 parts by weight of magnetizable particles in said magnetic layer.

7. In a magnetic recording medium having a non-magnetic base and a magnetic layer formed thereon containing magnetizable particles dispersed in a resinous binder, the improvement comprising wherein:

said magnetic layer has an organopolysiloxane coated onto the free surface of such layer, said organopolysiloxane having an average unit formula:

$$(CH_3)(RO)_n(R'COO)_mSiO_{(3-n-m)/2}$$

wherein R is a monovalent hydrocarbon group having from 1 to 5 carbon atoms, R′ is an aliphatic monovalent hydrocarbon group having from 7 to 17 carbon atoms; n is zero or a positive number, m is a positive number with the proviso that n + m is less than 3 and the number of Si atoms in a molecule of such organopolysiloxane ranges from 2 to 8; said organopolysiloxane being coated onto said magnetic layer in an amount ranging from about 30 to 1500 milligrams per square meter of said magnetic layer.

4,131,718
ROTATING ANODE FOR X-RAY TUBE

Bruno Childeric, Grenoble, France, assignor to Eurotungstene, Grenoble, France

Filed Feb. 15, 1978, Ser. No. 877,996
Claims priority, application France, Mar. 29, 1977, 77 10161
Int. Cl.[2] B22F *7/02*
U.S. Cl. 428—548 **2 Claims**

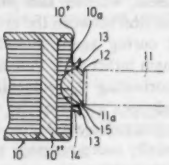
1. A rotating anode for an x-ray tube, comprising a body of sintered, molybdenum-based alloy coated with a layer of tung-

sten or tungsten alloy at least in the zone of impact of the electrons, wherein the coated molybdenum-based alloy contains by weight 3 to 10% of tungsten and 0.01 to 0.5% of zirconia.

4,131,719
LOAD-BEARING SURFACE FOR A SOLENOID

Tikahiro Nonoyama, Aichi, Japan, assignor to Sanmeidenki Kabushikikaisha, Japan

Division of Ser. No. 575,115, May 6, 1975, Pat. No. 4,002,283.
This application Oct. 6, 1976, Ser. No. 730,100
Claims priority, application Japan, Jun. 25, 1974, 49-72581
Int. Cl.[2] H01F *7/06*
U.S. Cl. 428—598 3 Claims



1. A plunger assembly, for a solenoid, comprising:

(i) a plunger having a plurality of silicon steel plates secured together to form a laminated body with end edges of said plates exposed at a load-bearing face of said body, said load-bearing face having in it a recess the face of which is shaped as a body of revolution about an axis normal to the load-bearing face and having its greatest radial dimension coinciding with the load-bearing face

(ii) a reinforcing element having an end portion with a convex end face the shape of which is substantially the counterpart of the face of the recess in the plunger, said reinforcing element being positioned with the axis of revolution of its end face normal to the load-bearing face of the plunger and with its end portion disposed in said recess with its end face at a spacing from the face of the recess, said reinforcing element being made of a material which is harder than the material constituting the plunger,

(iii) an intermediate layer of material disposed in the spacing between the face of the recess of the plunger and the end face of the reinforcing element, said intermediate layer being fused to the face of the recess and to the end face of the reinforcing element, said intermediate layer being composed of a fused mixture of the materials constituting respectively the plunger and the reinforcing element.

4,131,720
HEAVY-DUTY HEAT-RESPONSIVE BIMETALLIC MATERIAL

Heinz Spengler, Pforzheim, Germany, assignor to G. Rau, Pforzheim, Germany

Filed Mar. 16, 1977, Ser. No. 778,320
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1976, 2613954
Int. Cl.[2] B32B *15/18*
U.S. Cl. 428—619 4 Claims

1. A heavy-duty heat-responsive bimetallic material which comprises at least one metallic component of a material having a high coefficient of thermal expansion joined to a further metallic component of a material having a relatively low coefficient of thermal expansion, the material having a high coefficient of thermal expansion being a corrosion and heat resisting austenitic chromium-nickel steel consisting essentially of 14–26% by weight of chromium and 6–36% by weight of nickel, the remainder being iron and melt impurities and the material having the relatively low coefficient of thermal expansion being a thermally hardenable iron-nickel-titanium alloy consisting essentially of 30–55% by weight of nickel, 1–5% by weight of free titanium, the remainder being iron and melt impurities.

4,131,721
ELECTROLYTIC CELL HAVING A NOVEL ELECTRODE INCLUDING PLATINUM ON A CARBON SUPPORT ACTIVATED WITH A PHOSPHORUS-OXYGEN-CONTAINING COMPOUND

Shun C. Fung, Edison, and Yen-Chi Pan, Westfield, both of N.J., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

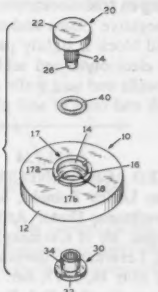
Filed Jun. 17, 1977, Ser. No. 807,523
Int. Cl.[2] H01M *8/08*
U.S. Cl. 429—13 15 Claims

1. An electrolytic cell comprising an anode electrode and a cathode electrode each being adapted for contact with an electrolyte, at least one of said electrodes including an electrocatalyst comprising platinum on a carbon support, said support including at least 1% by weight of phosphorus.

4,131,722
NON-FOULING RESEALABLE VENT

Raymond K. Sugalski, Gainesville, Fla., assignor to General Electric Company, Gainesville, Fla.

Filed Apr. 7, 1978, Ser. No. 894,399
Int. Cl.[2] H01M *2/02, 2/12*
U.S. Cl. 429—55 10 Claims



1. A resealable vented container comprising:

(a) a sealed casing having a plastic closure with a vent port in said closure,

(b) a metal grommet in said port, said grommet having a washer-like portion on the pressure container side of said closure extending outwardly from and circumferentially around said vent port and a sleeve portion extending through said port,

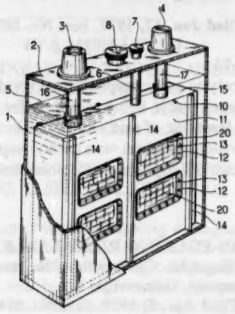
(c) a metal rivet member having a head portion at the outer side of said closure and a stem portion integral with said stem portion and extending through, but spaced from the wall of, said sleeve portion of said metal grommet, the inner end of said stem portion being upset onto the washer-like portion of said grommet and holding said rivet member in said grommet, and

(d) a pressure responsive, resilient member extending around said stem portion of said rivet, between said rivet head portion and the outer side of said closure, said resilient member forming a pressure seal between said rivet head and said outer side of said closure for preventing pressure from escaping from said container past said sleeve portion of said metal grommet and said metal rivet member stem portion when the container pressure increases to allow increased pressure to be vented from said container, past said sleeve and stem portions and past said pressure responsive, resilient means.

4,131,723
LEAD STORAGE BATTERY WITH LIMITED EVOLUTION OF GAS

Gerard Dalibard, Sevres, and Kha M. Pham, Epinay sur Seine, both of France, assignors to Compagnie Europeenne d'Accumulateurs, Paris, France

Filed Jan. 24, 1978, Ser. No. 871,884
Claims priority, application France, Dec. 28, 1977, 77 39467
Int. Cl.[2] H01M *10/52*
U.S. Cl. 429—81 13 Claims



1. A lead storage battery comprising; a container closed by a lid and containing an acid electrolyte together with a block of positive plates, negative plates and separators, the improvement wherein said block is tightly packed in a case which is immersed in the electrolyte and said case having walls and openings in said walls and said walls at said openings being in close contact with end ones of said plates of said block.

4,131,724
CROSSLINKED ACRYLONITRILE COPOLYMERS

Eduard Radlmann; Ulrich Reinehr, both of Dormagen; Peter Hoffmann, Leverkusen; Dieter Arlt, Cologne, and Gunther Nischk, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 18, 1977, Ser. No. 797,818
Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622920
Int. Cl.[2] C07D *85/36;* D01D *5/14*
U.S. Cl. 526—16 7 Claims

1. A process for the production of crosslinked acrylonitrile copolymer filaments or fibres, which comprises dissolving an acrylonitrile copolymer containing at least 20 mVal of carboxyl groups per kg of polymer together with at least one polyoxazoline, in a polar organic solvent at a temperature of from 20 to 120° C, the molar ratio of carboxyl groups to oxazoline groups amounting to at least 1:1, then spinning the resulting solution into filaments by a wet or dry spinning process and effecting crosslinking during drying of the filaments at a temperature of from 120 to 190° C.

4,131,725
POLYMER EPOXIDATION PROCESS

Kishore Udipi, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 8, 1977, Ser. No. 822,780
Int. Cl.[2] C08F *8/08*
U.S. Cl. 526—56 9 Claims

1. A process for the production of epoxidized polymers substantially free of gel which comprises contacting:
(a) a rubbery polymer of a conjugated diene in
(b) an aliphatic or alicyclic hydrocarbon diluent capable of dissolving said rubbery polymer with
(c) hydrogen peroxide and
(d) a mixture of formic acid and at least one other low molecular weight monocarboxylic acid under epoxidation conditions which produce substantially gel-free epoxidized rubbery polymers of conjugated diene.

4,131,726
PERFLUOROELASTOMERS FROM HYDROFLUOROELASTOMERS

Jon W. Martin, Los Alamitos, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Continuation of Ser. No. 495,490, Aug. 8, 1974, abandoned. This application Feb. 14, 1977, Ser. No. 768,136
Int. Cl.[2] C08F *8/22*
U.S. Cl. 526—18 2 Claims

1. An improved method of making a perfluoroelastomer of tetrafluoroethylene, perfluoro (alkyl vinyl ether), and a cross-linking component, wherein said perfluoroelastomer is vulcanized by the reaction between the cross-linking component and a difunctional curing agent including carbon to hydrogen bonds that remain intact after vulcanization, the improvement comprising fluorinating the vulcanized perfluoroelastomer to replace the hydrogen atoms of the reacted curing agent with fluorine atoms to a sufficient degree that the fluorinated elastomer is substantially more resistant to oxidation than the non-fluorinated elastomer.

4,131,727
METHOD OF PURIFYING ALCOHOL DEHYDROGENASE AND AFFINITY RESIN THEREFOR

Louis G. Lange, III, and Bert L. Vallee, both of Brookline, Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Division of Ser. No. 847,706, Nov. 2, 1977, which is a continuation-in-part of Ser. No. 640,629, Dec. 15, 1975. This application May 10, 1978, Ser. No. 904,319
Int. Cl.[2] C08F *8/30, 8/32*
U.S. Cl. 526—23 3 Claims

1. An affinity resin for binding alcohol dehydrogenase consisting essentially of an insoluble solid support having covalently bonded thereto pyrazole, said pyrazole being bonded at the 4-position by a connecting arm having a length of at least 12 Angstrom units.

4,131,728
METHOD FOR POLYMERIZING OLEFINICALLY UNSATURATED MONOMERS EMPLOYING A CATALYST COMPOSITION COMPRISING (A) SHOCK-SENSITIVE ORGANIC PEROXIDE AND (B) AN OLEFINIC UNSATURATED NON-HOMOPOLYMERIZABLE MONOMER

Duane B. Priddy, Coleman, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 758,282, Jan. 10, 1977, abandoned. This application Apr. 5, 1978, Ser. No. 893,644
Int. Cl.[2] C08F *4/34, 222/04, 12/02*
U.S. Cl. 526—204 3 Claims

1. In a method for polymerizing one or more olefinically unsaturated monomer, the method comprising admixing an organic peroxide with olefinically unsaturated polymerizable material maintaining the resultant mixture of monomeric material and a free-radical polymerization initiating peroxide at a polymerizing temperature and converting at least a portion of the monomeric material into polymeric material, the improvement which comprises providing the organic peroxide as an intimate admixture consisting essentially of (a) a shock-sensitive organic peroxide and (b) an olefinically unsaturated monomer, the olefinically unsaturated monomer which does not homopolymerize, (a) being present in a proportion of 10 to 90 parts by weight and (b) being present in a proportion of 90 to 10 parts by weight per 100 parts by weight of (a) and (b).

4,131,729

DENTAL COMPOSITIONS COMPRISING ACRYLIC ESTERS OF TRICYCLO [5.2.1.0^{2,6}] DECANE POLYMERS

Werner Schmitt; Robert Purrmann, both of Starnberg, Obb.; Peter Jochum, and Wolf-Dietrich Zahler, both of Hechendorf, all of Fed. Rep. of Germany, assignors to ESPE Fabrik Pharmazeutischer Präparate GmbH, Fed. Rep. of Germany

Filed Apr. 21, 1978, Ser. No. 898,680

Int. Cl.^{2} C08F *32/08, 132/08, 122/10, 4/34*

U.S. Cl. 526—282 12 Claims

1. A dental composition, especially for tooth fillings and dentures, including at least two components, one component comprising a polymerizable diacrylic acid ester selected from the group consisting of the diacrylic acid ester or dimethacrylic acid ester of bishydroxymethylthricyclo [5.2.1.0^{2,6}]-decane and mixtures thereof, the other component comprising a radical-forming substance.

4,131,730

MODIFIED POLYAMIC ACID FROM AMINOPHTHALIC ACID ANHYDRIDE AND DIANHYDRIDE

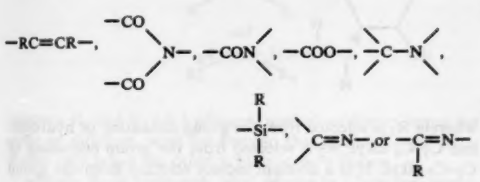
Gaetano F. D'Alelio, South Bend, Ind.

Division of Ser. No. 576,469, May 12, 1975, Pat. No. 4,064,113, which is a division of Ser. No. 370,286, Jun. 15, 1973, abandoned. This application Aug. 3, 1977, Ser. No. 821,405

Int. Cl.^{2} C08G *69/12, 69/48*

U.S. Cl. 528—327 15 Claims

1. The process of preparing a modified film-forming polyamic acid which comprises reacting an aminophthalic acid of the formula $H_2NC_6H_nY_{3-n}(CO)_2O$ wherein Y represents a halogen selected from the group consisting of F, Br and Cl, and *n* represents an integer having a value of 0 to 3, in an inert organic solvent in which the polymer is soluble, at a temperature of about 10°–100° C with 0.5 to 0.001 mole, per mole of the aminoanhydride, of a compound having the formula $Ar(CO)_2O_2$, in which Ar represents single, fused and heterocyclic aromatic rings, said heterocyclic rings being selected from the class consisting of pyridine quinoline and quinoxaline, and a multiplicity of such rings linked to each other directly or by —O—, —S—, —CO—, —SO_2—, —CR_2—, —NR—,



linkages in which R represents hydrogen or a hydrocarbon group containing one to twelve carbon atoms, and the remaining positions in the Ar groups being occupied by hydrogen and a halogen selected from the class consisting of F, Cl and Br.

4,131,731

PROCESS FOR PREPARING POLYCARBONATES

Kwo-Hrong Lai, Lynnfield, and Harold N. Silvers, Cambridge, both of Mass., assignors to Beatrice Foods Company, Peabody, Mass.

Continuation of Ser. No. 739,456, Nov. 8, 1976, abandoned. This application Jan. 9, 1978, Ser. No. 867,752

Int. Cl.^{2} C08G *63/62, 18/42, 18/14;* C08L *69/00*

U.S. Cl. 528—370 14 Claims

1. A process of preparing linear polycarbonates containing terminal hydroxyl groups, said process comprising,

reacting an alkylene carbonate composed of a 5 to 7 membered ring with a hydroxy compound selected from the group consisting of cycloaliphatic diols and aliphatic diols containing from 4 to 40 carbon atoms, and polyoxyalkylene glycols containing from 2 to 20 alkoxy groups per molecule with each alkoxy group containing from 2 to 4 carbon atoms,

said hydroxy compound having a boiling point greater than 4.9° C over the by-product formed in ester interchange reaction with said alkylene carbonate,

said hydroxy compound and alkylene carbonate being admixed in a molar ratio of 10 to 1, to 1 to 10,

said reaction being carried out at temperatures between 100° C and 300° C and pressures between 0.1 and 300 Hg in a first and second stage wherein low molecular polycarabonate is formed in a first stage at a molecular chain length of from 2 to 10 units while distilling off by-product glycol from the reaction mixture, and then removing unreacted hydroxyl compound and alkylene carbonate and beginning a second stage which comprises condensing the low molecular weight polycarbonate by distilling off all glycol formed at temperatures of from 100 to 300° C to form high molecular weight polycarbonate.

4,131,732

METHOD FOR PREPARING AURANOFIN

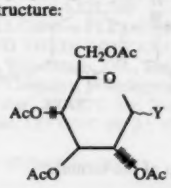
David T. Hill, North Wales; Blaine M. Sutton, Hatboro, both of Pa., and Ivan Lantos, Blackwood, N.J., assignors to Smith-Kline Corporation, Philadelphia, Pa.

Filed Apr. 21, 1977, Ser. No. 789,603

Int. Cl.^{2} C07H *5/10*

U.S. Cl. 536—121 5 Claims

1. The method of preparing auranofin comprising reacting a compound of the structure:



in which Ac is acetyl and Y is bromo, chloro, tosyloxy, brosyloxy, trifluoromethanesulfonyloxy or mesyloxy with sodium or potassium sulfide and triethylphosphinegold(I) chloride, bromide or iodide.

4,131,733

WATER-INSOLUBLE AZOMETHINE COMPOUNDS

Klaus Hunger, Kelkheim, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

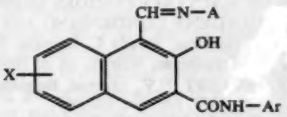
Continuation of Ser. No. 653,119, Jan. 28, 1976, abandoned, which is a continuation-in-part of Ser. No. 550,918, Feb. 19, 1975, abandoned. This application Aug. 24, 1977, Ser. No. 827,380

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1974, 2408291

Int. Cl.^{2} C09B *17/04*

U.S. Cl. 542—406 10 Claims

1. A compound of the formula



wherein X is hydrogen, chlorine or bromine, Ar is phenyl or naphthyl which are unsubstituted or substituted by 1 to 3 substituents selected from the group consisting of halogen; lower alkyl; lower alkoxy; trifluoromethyl; nitro; cyano; carboxy; lower carbo-alkoxy; lower alkyl sulfonyl; carbamoyl; sulfamoyl; carboxylic or sulfonic acid mono- or di-(lower alkyl)amide; carboxylic or sulfonic acid anilide which are

unsubstituted in the phenyl nucleus or substituted by halogen, lower alkyl, lower alkoxy, cyano, carbamoyl or sulfamoyl; lower alkanoyl amino; phenyl sulfonyl or benzoyl amino which are unsubstituted in the phenyl nucleus or substituted by halogen, lower alkyl, lower alkoxy, cyano or nitro; or two substituents on Ar being phenyl together stand for a fused saturated 5- or 6-membered ring consisting of two adjacent carbon atoms of the phenyl nucleus and further ring members selected from the group consisting of —CO—, —NH—, —O— and —S—; and A is benzimidazolonyl-(2) which is unsubstituted or substituted by chlorine, methyl, methoxy, ethoxy, or nitro.

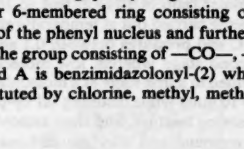
4,131,734

7β-ACYLOXY-3-HETEROCYCLICTHIOMETHYL CEPHALOSPORINS

John G. Gleason, Delran, N.J., assignor to SmithKline Corporation, Philadelphia, Pa.

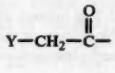
Division of Ser. No. 588,096, Jun. 18, 1975, Pat. No. 4,020,057. This application Dec. 1, 1976, Ser. No. 746,287
Int. Cl.² C07D *501/60*
U.S. Cl. 544—26 **4 Claims**

1. A compound of the formula:



in which:

R^1 is an acyl group of the formula:



where:

Y is cyano, sydnone or aminomethylphenyl;

and R^2 is SHet where Het is selected from the group consisting of 1,2,3,-triazolyl, 1,2,4-triazolyl, tetrazolyl, oxazolyl, thiazolyl, 1,3,4-oxadiazolyl, 1,3,4-thiadiazolyl, 1,2,4-thiadiazolyl, pyridyl, pyrimidyl and pyrazinyl, each such heterocyclic ring being unsubstituted or substituted with from one to two groups selected from lower alkyl, alkoxyalkyl and trifluoromethyl, each alkyl or alkoxy group having from one to four carbon atoms, or a non-toxic pharmaceutically acceptable salt thereof.

4,131,735

PREPARATION OF α-ACYLACETAMIDES USING TETRAMETHYL GUANIDINE CONDENSING AGENT

Raphäel K. Van Poucke, Berchem; Freddy C. Baeyens, Wommelgem, and Paul A. Mortelmans, Wilrijk, all of Belgium, assignors to AGFA-GEVAERT, N.V., Mortsel, Belgium

Filed Nov. 25, 1975, Ser. No. 635,063
Int. Cl.² C07D *235/00, 239/72, 253/06, 253/04*
U.S. Cl. 544—267 **7 Claims**

1. Method for the preparation of an α-substituted-α-acylacetamide by reaction of an α-acyl-α-halo-acetamide with an organic compound with an acid strength in terms of pKa between 7 and 12 in a medium of an aprotic solvent, characterised in that the reaction occurs in the presence of a tetramethyl guanidine as basic condensing agent.

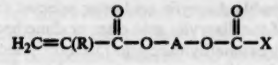
4,131,736

POLYMERS OF SULFONIC ACID MONOMERS

William D. Emmons, Huntingdon Valley, and Graham Swift, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 134,905, Apr. 16, 1971, Pat. No. 3,770,801. This application Aug. 7, 1972, Ser. No. 273,886
Int. Cl.² C07C *143/52*
U.S. Cl. 560—14 **5 Claims**

1. As a composition of matter, a polymer of a compound and salts thereof, of the formula:



(I)

wherein R is hydrogen or methyl, A is an alkylene group having 2 to 10 carbon atoms, at least 2 of which extend in a chain between the adjoined oxygen atoms, and X is a benzene ring substituted by at least one sulfonic acid group and at least one carboxylic group, said polymer being an addition polymer.

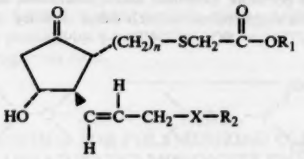
4,131,737

15-DEOXY-16-HYDROXY-16-SUBSTITUTED-3-THIA-PROSTANOIC ACIDS

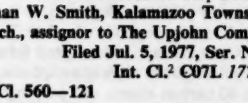
Middleton B. Floyd, Jr., Suffern, N.Y.; Martin J. Weiss, Oradell, N.J.; Charles V. Grudzinskas, Nyack, N.Y., and Sow-mei C. Chen, Park Ridge, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 706,343, Jul. 19, 1976, Pat. No. 4,061,670. This application Mar. 30, 1977, Ser. No. 782,858
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 **54 Claims**

1. A compound of the formula



wherein R_1 is selected from the group consisting of hydrogen and C_1–C_6 alkyl; R_2 is selected from the group consisting of C_3–C_7 alkyl; N is a divalent moiety selected from the group consisting of those of the formulae:



wherein R_3 is selected from the group consisting of vinyl and cyclopropyl; n is an integer from 3 to 5, inclusive; and when R_1 is hydrogen, the pharmacologically acceptable cation salts thereof.

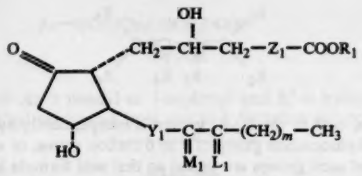
4,131,738

6-HYDROXY-PGE$_1$ COMPOUNDS

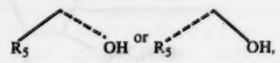
Herman W. Smith, Kalamazoo Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 5, 1977, Ser. No. 812,794
Int. Cl.² C07L *177/00*
U.S. Cl. 560—121 **36 Claims**

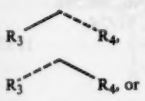
1. A prostacyclin analog of the formula



wherein Z_1 is
(1) $-(CH_2)_g-CH_2-CH_2-$,
(2) $-(CH_2)_g-CH_2-CF_2-$, or
(3) trans-$(CH_2)_g-CH=CH-$,
wherein g is the integer one, 2, or 3;
wherein Y_1 is
(1) trans-CH=CH—,
(2) cis-CH=CH—,
(3) $-CH_2CH_2-$,
(4) trans-CH=C(Hal)—, or
(5) —C≡C—
wherein Hal is chloro or bromo;
wherein M_1 is

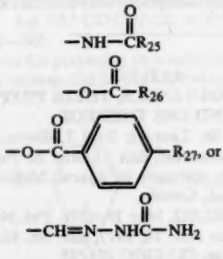


wherein R_5 is hydrogen or alkyl with one to 4 carbon atoms, inclusive;
wherein L_1 is



a mixture of

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen; alkyl of one to 12 carbon atoms, inclusive; cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive; phenyl; phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms; phenyl substituted in the para position by



(a)
(b)
(c)
(d)

wherein R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $-NH_2$; R_{26} is methyl, phenyl, $-NH_2$, or methoxy; and R_{27} is hydrogen or acetamido, inclusive; or a pharmacologically acceptable cation;
wherein m is the integer one to 5, inclusive.

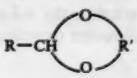
4,131,739

CATALYTIC REARRANGEMENT OF CYCLIC ACETALS TO CARBOXYLIC ESTERS

Don L. Morris, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 11, 1977, Ser. No. 814,562
Int. Cl.² C07C *69/66*
U.S. Cl. 560—179 **9 Claims**

1. A catalyzed method for the rearrangement of a cyclic acetal having the formula



to an isomeric carboxylic acid ester wherein R is an alkyl, alkenyl, phenyl or alkyl substituted phenyl moiety containing 1 to 12 carbon atoms, and R′ is alkyl or alkenyl moiety containing 1 to 12 carbon atoms, whereby the cyclic acetal is contacted with a catalytically effective amount of a metal selected from the group Ru, Rh, Pd, Os, Ir or Pt supported on carbon at a temperature of from about 200° C. to about 400° C.

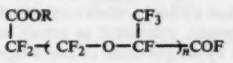
4,131,740

ALKYL PERFLUORO-ω-FLUOROFORMYL ESTERS AND THEIR PREPARATION

David C. England, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1977, Ser. No. 789,724
Int. Cl.² C07C *69/34, 69/63*
U.S. Cl. 560—180 **5 Claims**

1. A compound of the formula:



wherein R is alkyl of 1–6 carbon atoms, and n is 1–6.

4,131,741

COBALT-CATALYZED OXIDATION OF C_3 TO C_7 SATURATED ALIPHATIC HYDROCARBONS TO OXYGENATED PRODUCTS

John S. Bartlett, Hull, and Barry Hudson, Beverley, both of England, assignors to BP Chemicals Limited, London, England

Division of Ser. No. 706,197, Jul. 16, 1976, Pat. No. 4,086,267. This application Dec. 29, 1976, Ser. No. 755,148
Claims priority, application United Kingdom, Jul. 21, 1975, 30389/75; Sep. 17, 1975, 38180/75
Int. Cl.² C07C *45/02, 51/20, 67/00*
U.S. Cl. 560—241 **10 Claims**

1. A process for the production of oxygen-containing organic compounds including a substantial proportion of acetic acid by the oxidation of a saturated aliphatic hydrocarbon containing from 3 to 7 carbon atoms or a mixture thereof which process consists of contacting the hydrocarbon or mixture thereof in a reaction zone with a molecular oxygen-containing gas in the presence of an essentially inert reaction medium and a soluble cobalt catalyst in an amount, calculated as cobalt, within the range from 0.1 to 10% by weight based on the weight of reaction medium, at a temperature in the range from 70 to 150° C and a pressure sufficient to maintain said reactants in the liquid phase, not less than 5 and not more than 90 percent of said cobalt catalyst being introduced into said reaction zone in the +3 oxidation state in a continuous process and not less than 11 and not more than 90% of said cobalt

catalyst being introduced into said reaction zone in the +3 oxidation state in a batch process, to form a liquid product consisting of a mixture of oxygen-containing organic compounds containing a substantial proportion of acetic acid and water, feeding said liquid product to a distillation zone wherein a catalyst solution fraction consisting of inert reaction medium and cobalt, of which from 5 to 90 percent is in the +3 oxidation state for continuous operation and from 11 to 90% is in the +3 oxidation state for batch operation, is separated as a base product from a distillate fraction consisting of oxygen-containing organic compounds, the residence time of said catalyst solution in said distillation zone being so adjusted that it is the minimum consistent with substantially complete separation of said fractions so as to minimize the reduction of cobalt in the +3 oxidation state to cobalt in the +2 oxidation state to maintain the proportion of cobalt in the +3 oxidation state as hereinbefore defined, and thereafter recycling said catalyst solution to said oxidation zone.

4,131,742

COBALT-CATALYZED OXIDATION OF HYDROCARBONS

Barry Hudson, Beverley, England, assignor to BP Chemicals Limited, London, England

Filed Nov. 3, 1976, Ser. No. 738,534

Claims priority, application United Kingdom, Nov. 3, 1975, 45650/75

Int. Cl.² C07C *27/12, 45/02, 51/20, 67/00*

U.S. Cl. 560—241 **22 Claims**

1. In a continuous process for the production of oxygen-containing organic compounds including a substantial proportion of acetic acid by the oxidation of a saturated aliphatic hydrocarbon containing from 3 to 7 carbon atoms or a mixture thereof in a reaction zone with a molecular oxygen-containing gas in the presence of an essentially inert reaction medium comprising a lower aliphatic carboxylic acid having from 2 to 4 carbon atoms and a soluble cobalt catalyst other than a cobalt halide in the amount, calculated as cobalt, within the range from 0.1 to 10% by weight based on the weight of the reaction medium, at a temperature in the range from 70 to 150° C. and a pressure sufficient to maintain the reactants in the liquid phase, in which a substantially gas-free liquid is withdrawn from the base of said reaction zone and separated into a fraction containing the bulk of said oxygen-containing organic compounds and a fraction consisting of said essentially inert reaction medium with said cobalt catalyst dissolved therein, said latter function being recycled to said oxidation zone, the improvement which comprises carrying out the reaction in a reaction vessel either fabricated in or lined, on at least that part of the internal surface thereof in contact with the liquid reaction medium, with a substantially chromium-free material so as to maintain the concentration of chromium in the reaction medium at a level not greater than 400 ppm.

4,131,743

PROCESS FOR PREPARING UNSATURATED DIESTERS

Yoshinori Yoshida, Yokohama; Tutomu Kobayashi, Ibaraki; Hironobu Shinohara, Yokohama, and Izumi Hanari, Tokyo, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

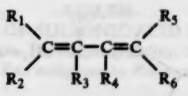
Filed Jul. 6, 1976, Ser. No. 702,935

Claims priority, application Japan, Jul. 17, 1975, 50/86657; Dec. 11, 1975, 50/146902

Int. Cl.² C07C *67/05*

U.S. Cl. 560—244 **25 Claims**

1. A process for producing unsaturated glycol diesters which comprises reacting in a flowing gaseous phase, a gaseous mixture comprising a conjugated diene of the formula:



wherein, each of the R_1-R_6 groups is independently hydrogen or a hydrocarbon group of 1 to 6 carbon atoms, or wherein two of such groups are joined so that said formula includes cyclopentadiene and cyclohexadiene;

and aliphatic, alicyclic or aromatic carboxylic acid; and molecular oxygen at a temperature of 100° C. to 300° C. in the presence of a catalyst carrier, and a catalyst consisting essentially of:

(a) palladium in the proportion of 0.1 to 10% by weight based on the weight of the carrier;

(b) vanadium in the amount of 0.01 to 20 gram atoms per gram atom of palladium;

(c) antimony in an amount of 0.01 to 20 grams per gram atom of palladium, the ratio of antimony to vanadium being 0.1 to 10 in terms of gram atoms, and

(d) at least one alkali metal carboxylate in the proportion of 0.01 to 40 m mole per gram of carrier.

4,131,744

4,5-DISUBSTITUTED-1-AMINOALKYL CYCLOHEXENES

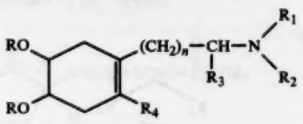
Joseph E. Sundeen, Yardley, Pa., and Frederic P. Hauck, Somerville, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Apr. 25, 1977, Ser. No. 790,784

Int. Cl.² C07C *93/24, 91/24*

U.S. Cl. 560—252 **17 Claims**

1. A compound of the formula:



including its stereoisomers wherein R is hydrogen

R_1 and R_2 are independently selected from the group consisting of hydrogen, lower alkyl, and cycloalkyl of 3 to 7 carbons; R_3 and R_4 are independently selected from the group consisting of hydrogen and lower alkyl; n is 0 or an integer from 1 to 3; X is hydrogen, halogen, lower alkyl, lower alkoxy, or nitro; and a pharmaceutically acceptable acid addition salt thereof.

4,131,745

ARYLOXY AMINOBUTANOLS, THEIR PREPARATION AND USE THEREOF

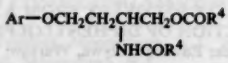
Jean-Marie Ferland, St. Laurent; Real Laliberte, Chomeday; Wilbur Lippman, Montreal, and Thomas A. Pugsley, Kirkland, all of Canada, assignors to Ayerst, McKenna & Harrison, Ltd., Montreal, Canada

Division of Ser. No. 687,852, May 19, 1976, Pat. No. 4,071,552. This application Nov. 18, 1977, Ser. No. 852,656

Int. Cl.² C07C *103/38*

U.S. Cl. 560—252 **8 Claims**

1. A compound of formula 3



in which Ar is phenyl or 1-naphthyl and R^4 is hydrogen or lower alkyl containing from one to five carbon atoms.

4,131,746
(DL)-13-SUBSTITUTED SULFINYL-PROSTAGLANDIN-LIKE COMPOUNDS AND METHODS OF MAKING

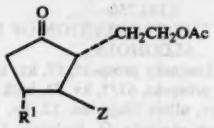
Karl G. Untch, Los Altos, Calif., and Gilbert J. Stork, New York, N.Y., assignors to Syntex (USA) Inc., Palo Alto, Calif.

Division of Ser. No. 673,846, Apr. 5, 1976, Pat. No. 4,049,697, which is a division of Ser. No. 476,362, Jun. 5, 1974, Pat. No. 3,970,685. This application Jan. 7, 1977, Ser. No. 757,540

Int. Cl.[2] **C07C** *147/14*

U.S. Cl. 560—255 **3 Claims**

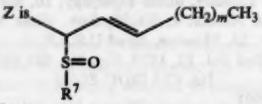
1. The (dl) compounds of the formula:



(C)

wherein Ac is acetyl;

R^1 is hydrogen or OR^6, in which R^6 is hydrogen;



wherein R^7 is alkyl containing from one through six carbon atoms, cycloalkyl containing from five through seven carbon atoms, chloromethyl, trichloromethyl, trifluoromethyl, chlorodifluoromethyl, dichlorofluoromethyl, β-chloroethyl, α-chloroethyl, α-chloro-β-trichloroethyl, phenyl, p-tolyl, p-chlorophenyl, p-fluorophenyl, 2,4-dichlorophenyl, or 2,5-dichlorophenyl, and m is a whole integer from two through eight; and

the wavy line (∿) represents the α or β configuration or mixtures thereof.

4,131,747
PROCESS FOR PREPARING α-SUBSTITUTED PHENYLALKANECARBOXYLIC ACID

Masayasu Kurono; Masaaki Toda, both of Osaka; Haruki Niwa, Kyoto; Syunji Kosuge, Takatsuji; Takahumi Iida, Nishinomiya, and Kenichi Narita, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

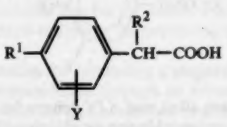
Filed Nov. 19, 1976, Ser. No. 743,258

Claims priority, application Japan, Nov. 19, 1975, 50-138041

Int. Cl.[2] **C07C** *63/52, 63/33, 65/02*

U.S. Cl. 562—469 **5 Claims**

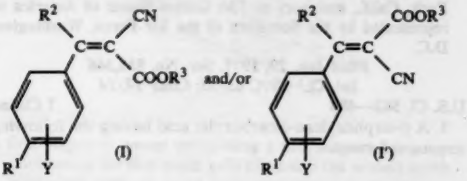
1. A process for preparing an α-substituted phenylalkanecarboxylic acid represented by the following general formula (IV)



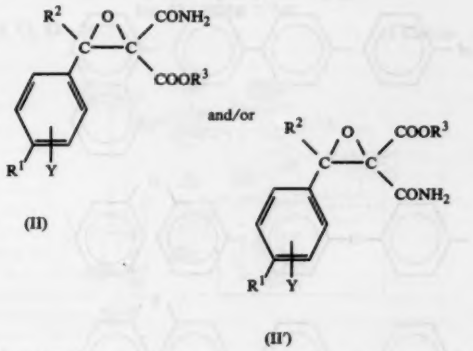
(IV)

wherein R^1 represents a straight or branched alkyl group having 1 to 4 carbon atoms, a straight or branched alkoxy group having 1 to 4 carbon atoms, a cyclohexyl group, an unsubstituted phenyl group or a phenyl group substituted with a straight or branched alkyl group having 1 to 4 carbon atoms, a straight or branched alkoxy group having 1 to 4 carbon atoms or a halogen atom, an unsubstituted phenoxy group or a phenoxy group substituted with a halogen atom, or a benzyl group; R^2 represents a hydrogen atom or a straight or branched alkyl group having 1 to 4 carbon atoms; and Y represents a hydrogen atom or a halogen atom; which comprises:

(i) treating a compound represented by the following general formula (I) and/or (I'):



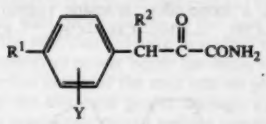
wherein R^1, R^2 and Y are the same as defined above; and R^3 represents a hydrogen atom or an alkyl group; with a peroxide in the presence of a solvent at a temperature ranging from about 0° C to about the boiling point of the solvent and under weakly alkaline conditions of a pH of about 8 to about 10 and using about 3 to about 5 molar equivalents of said peroxide to the total of said compound of the general formula (I) and/or (I') to prepare a compound represented by the following general formula (II) and/or (II'):



(II')

wherein R^1, R^2, R^3 and Y are the same as defined above;

(ii) hydrolyzing the compound represented by the general formula (II) and/or (II')) wherein said hydrolysis is in the presence of a solvent under alkaline conditions at a temperature of from about 0° C to about the boiling point of the solvent, and then causing a decarboxylation by heating to a temperature of about 70° to about 120° C involving a rearrangement to produce a compound represented by the following general formula (III):



(III)

wherein R^1, R^2, and Y are the same as defined above; and

(iii) oxidizing the compound represented by the general formula (III) in the presence of a solvent and at a temperature of about −10° C to about room temperature with an oxidant employed in an amount of about 1.1 to about 1.5

mol equivalents to said compound represented by the general formula (III) to obtain the compound represented by the general formula (IV).

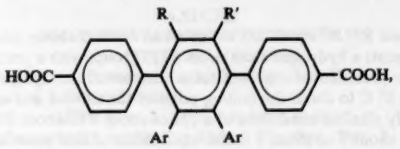
4,131,748

p-TERPHENYLENE-DICARBOXYLIC ACIDS AND THEIR SYNTHESIS

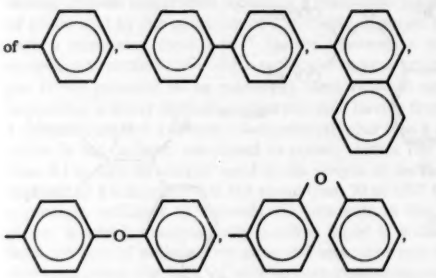
Fred E. Arnold, Centerville, Ohio, and James F. Wolfe, Menlo Park, Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 29, 1977, Ser. No. 811,346
Int. Cl.[2] C07C *63/33;* C08F *18/14*
U.S. Cl. 562—488 **7 Claims**

1. A p-terphenylene-dicarboxylic acid having the following structural formula:



wherein Ar is a monovalent aromatic radical selected from the group consisting of



and R and R' are individually selected from the group consisting of hydrogen, a monovalent aromatic radical as listed above, $-CH_2-CH_3$, $-CH_2-CH_2-CH_3$, $-CH_2-CH_2-CH_2-CH_3$,

4,131,749

METHOD FOR WASTE RECOVERY FROM A PROCESS OF THE PRODUCTION OF DIPHENYLOLPROPANE

Maciej Kiedik, Gliwice; Edward Grzywa, Warsaw; Jozef Kolt, Zabrze; Kazimierz Terelak, Kedzierzyn-Kozle; Jerzy Czyz, Kedzierzyn-Kozle, and Anna Niezgoda, Kedzierzyn-Kozle, all of Poland, assignors to Instytut Ciezkiej Syntezy Organicznej "Blachownia", Kedzierzyn-Kozla, Poland

Filed Aug. 25, 1977, Ser. No. 827,780
Claims priority, application Poland, Sep. 12, 1976, 192402
Int. Cl.[2] C07C *39/06*
U.S. Cl. 568—781 **1 Claim**

1. A method for processing the waste products obtained in the production of diphenylolpropane by condensation of acetone with phenol in the presence of acid catalysts, which comprises catalytic pyrolysis of said waste products in the presence of sodium hypophosphite as catalyst in the amount of 0.01% to 0.5% by weight, at a temperature of 150° to 250° C. and under reduced pressure in the range of 5.50 mm Hg and recovering the resulting phenol, o-, and p- isopropenylphenol.

4,131,750

PROCESS FOR THE PRODUCTION OF FATTY ALCOHOLS

Khabib M. Minachev, Leninsky prospekt, 57, kv. 15; Evgeny S. Mortikov, Leninsky prospekt, 61/1, kv. 34, both of, Moscow; Alexandr S. Leontiev, ulitsa Gagarina, 13, kv. 13, Bashkirskaya ASSR, Salavat; Anatoly G. Smirnov, Leningradsky prospekt, 78, korpus 5, kv. 110, Moscow; Nikolai F. Kononov, ulitsa Garibaldi, 13/54, kv. 4, Moscow; Alexei A. Masloboev-Shvedov, Nagatinskaya naberezhnaya, 16, kv. 75, Moscow; Alexandr K. Zhomov, ulitsa Tsjurjupy, 16, korpus 2, kv. 70, Moscow, and Nikolai I. Kholdyakov, ulitsa Marshala Birjuzova, 2, kv. 23, Moscow, all of U.S.S.R.

Filed Jul. 12, 1974, Ser. No. 488,183
Int. Cl.[2] C07C *29/04*
U.S. Cl. 568—901 **11 Claims**

1. A process for the production of fatty alcohols containing from 2 to 5 carbon atoms, comprising reacting an olefin containing from 2 to 5 carbon atoms with water at a temperature of from 150° C. to 280° C. and a pressure of from 10 to 70 atmospheres in the presence of a catalyst of an aluminosilicate Y-type zeolite containing a calcium cation and chromium oxide.

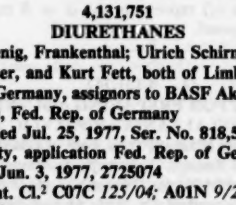
4,131,751

DIURETHANES

Karl-Heinz Koenig, Frankenthal; Ulrich Schirmer, Heidelberg; Bruno Wuerzer, and Kurt Fett, both of Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jul. 25, 1977, Ser. No. 818,523
Claims priority, application Fed. Rep. of Germany, Jul. 28, 1976, 2638897; Jun. 3, 1977, 2725074
Int. Cl.[2] C07C *125/04;* A01N *9/20*
U.S. Cl. 560—29 **7 Claims**

1. Diurethanes of the formula

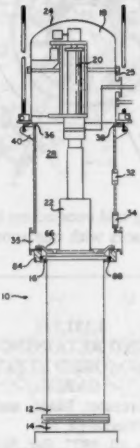


where R denotes lower alkyl, and X/Y denote the combination fluorine/fluorine, fluorine/chlorine or chlorine/fluorine.

4,131,752
CURRENT CONDUCTING ATMOSPHERE CONTROL SLEEVE FOR ELECTROSLAG FURNACE

Patrick J. Wooding, Moorestown, N.J., assignor to Wooding Corporation, Moorestown, N.J.

Continuation-in-part of Ser. No. 773,334, Mar. 1, 1977, and a continuation-in-part of Ser. No. 616,365, Sep. 24, 1975, Pat. No. 4,032,705. This application May 5, 1977, Ser. No. 794,043
Int. Cl.[2] H05B *3/60*; F27B *14/12*
U.S. Cl. 13—9 ES 11 Claims



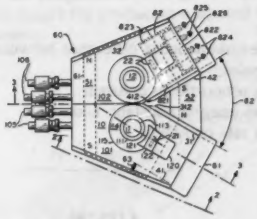
1. In an electroslag melting furnace comprising a crucible means and a furnace head spaced from the top of said crucible means, said furnace head being adapted to suspend a consumable electrode within said crucible means, the improvement comprising: means for making the space between said crucible means and said furnace head air tight, said means including a sleeve member and means for moving said sleeve member between an inoperative position and an operative position wherein said sleeve member substantially surrounds said space and means allowing for the control of the atmosphere within said space; said sleeve member having a first end adapted to be electrically connected to said crucible means and a second end adapted to be electrically connected to said furnace head whereby said sleeve member, when in said operative position, is adapted to function as part of the return conductor path between said crucible means and the power supply for said furnace.

4,131,753
MULTIPLE ELECTRON-BEAM VAPOR SOURCE ASSEMBLY

Kazumi N. Tsujimoto, Moraga, and Paul S. McLeod, Berkeley, both of Calif., assignors to Airco, Inc., Montvale, N.J.

Filed May 18, 1977, Ser. No. 797,965
Int. Cl.[2] H01J *37/305*
U.S. Cl. 13—31 EB 10 Claims

1. A vapor source assembly comprising:
a first crucible for containing a first material to be vaporized;
a second crucible positioned near the first crucible for containing a second material to be vaporized;
a first electron-beam gun for producing a first electron beam;
a second electron-beam gun for producing a second electron beam; and
a deflecting means for producing a magnetic field to deflect the first electron beam through an arcuate path from the first electron-beam gun to the first crucible, and to deflect the second electron beam through an arcuate path from the second electron-beam gun to the second crucible, said deflecting means including
a first north pole piece and a first south pole piece positioned on opposite sides of the first electron-beam gun,
a second north pole piece and a second south pole piece positioned on opposite sides of the second electron-beam gun,

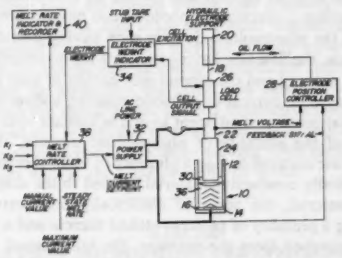


a first magnetic means comprising a first magnet for interconnecting the first south pole piece and the second north pole piece, and
a second magnetic means comprising a second magnet for interconnecting the second south pole piece and the first north pole piece.

4,131,754
AUTOMATIC MELT RATE CONTROL SYSTEM FOR CONSUMABLE ELECTRODE REMELTING

Raymond J. Roberts, West Berlin, N.J., assignor to Consare Corporation, Rancocas, N.J.

Filed May 2, 1977, Ser. No. 793,005
Int. Cl.[2] H05B *7/148*
U.S. Cl. 13—34 11 Claims



10. A method of melting a consumable electrode at an increased melt rate in a fluid cooled electroslag remelting furnace using a closed loop control system, including:
establishing the initial melting conditions in the control system to cause the melt rate to initially exceed the control system melt rate set point;
then causing the melt rate to return to the melt rate set point over a period of time while the first portion of the ingot ingot being formed;
said melt rate being caused to exceed the control system melt rate set point by establishing the initial electrical power at a value which is in excess of that required to bring the melt rate from start up conditions to the melt rate set point; causing the melt rate to return to said set point by reducing the electrical power below the initial value when the melt rate has exceeded the melt rate set point;
controlling the electrical power through a power supply having a regulatable output melting current by using the closed loop melt rate control system to vary the output melting current of the power supply; and
regulating the output melting current in accordance with the following equations:

$$I\,\text{Melt} = I\,\text{Manual} - \Delta I \qquad (1)$$

where:
I Melt is the value of the melting current; and
I Manual is the initial current value fixed by the furnace operator

$$\Delta I = K_1 e + K_2 \int e\,dt + K_3\, de/dt \quad (2)$$

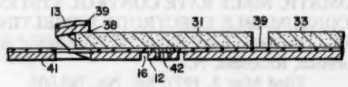
where:
e is the instantaneous difference between actual melt rate set point;
K_1 is a proportional constant;
K_2 is an integral constant; and
K_3 is a rate constant.

4,131,755

INTERCONNECTION FOR PHOTOVOLTAIC DEVICE ARRAY

Michael C. Keeling, Tempe; William L. Bailey, Scottsdale; Michael G. Coleman, Tempe; Israel A. Lesk, Scottsdale, and Robert A. Pryor, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 17, 1977, Ser. No. 807,462
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 P **9 Claims**



1. A photovoltaic solar module for converting radiant energy to electric current and having an interconnection sheet comprising: a plurality of photovoltaic devices arranged in an array, the photovoltaic devices each having a first and a second side, the first side having contacts for providing current of a first polarity and the second side having at least one contact for providing current of a second polarity; a sheet of dielectric material positioned adjacent to and in contact with the second sides of the plurality of photovoltaic devices, the sheet of dielectric material having a plurality of voids therein; a sheet of electrically conductive material bonded to the sheet of dielectric material, the sheet of electrically conductive material having a plurality of patterns etched therein and a plurality of tabs punched from the patterns, the tabs shaped to have an acute angle in the plane of the patterns and having one end attached to the pattern, the acute angled tabs protruding through the sheet of dielectric material so that a portion of the acute angled tabs can make contact with the contacts on the first side of the photovoltaic device and each pattern of the sheet of electrically conductive material making contact with the second side of one of the photovoltaic devices through one of the plurality of voids in the sheet of dielectric material.

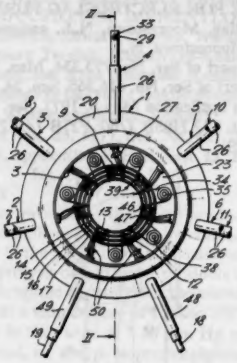
4,131,756

SENSOR-ASSEMBLIES FOR ENGINES

Edric R. Smith, Bookham, England, assignor to Smiths Industries Limited, London, England

Filed Sep. 29, 1977, Ser. No. 837,792
Claims priority, application United Kingdom, Sep. 30, 1976, 40698/76
Int. Cl.² H01L *35/02*
U.S. Cl. 136—230 **9 Claims**

1. A sensor-assembly for use in an engine, comprising a hub, a plurality of sensors, electrical conductors connected with said sensors, means mounting the said sensors about the said hub, a plurality of electrically-conductive rings, means mounting said rings concentrically with one another within said hub,



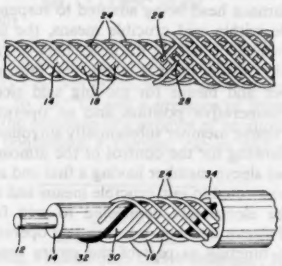
and means for securing said conductors to said rings to electrically connect said sensors with one another.

4,131,757

HELICALLY WOUND RETAINING MEMBER FOR A DOUBLE CAGED ARMORED ELECTROMECHANICAL CABLE

Edward M. Felkel, Worcester, Mass., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1977, Ser. No. 823,250
Int. Cl.² H01B *7/18, 9/02*
U.S. Cl. 174—107 **10 Claims**

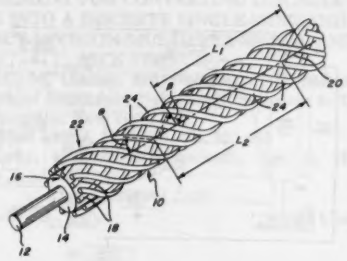


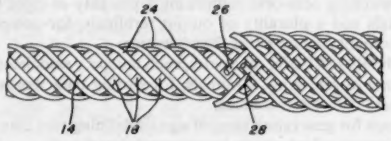
1. A multiple caged armored cable of a given length, said cable comprising:
a core;
means covering said core for protecting the same;
a plurality of armored layers of wires located about said covering means, each armored layer being formed from a plurality of wires successively helically wound directly about the preceding layer, the first layer being wound directly over said core;
means for insulatively jacketing the multiple caged armored cable for protecting the cable; and
means, formed as a portion of at least one of said inner layers, for retaining each of the individual wires in the next successive layers wound thereupon, said retaining means being generally similar to the wires making up the layer in which said retaining means is located, said retaining means being helically wound along with the wires in the layer in which it is located and being formed having a generally impressionable outer surface which is configured to partially accept wires in the next successive layer for statically retaining the same.

4,131,758
DOUBLE CAGED ARMORED ELECTROMECHANICAL CABLE

Edward M. Felkel, Worcester, Mass., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1977, Ser. No. 823,251
Int. Cl.[2] H01B *7/18, 9/02*
U.S. Cl. 174—107 12 Claims





1. A multiple caged tapered strength armored cable of a given length, said cable comprising:

a core;

means covering said core for protecting the same;

a plurality of armored and caged layers of wires located about said covering means, each armored layer being formed from a plurality of wires successively helically wound directly about the preceeding layer, the first layer being wound directly over said core, each of said plurality of wires in each layer being spaced from the adjacent two wires to form a radial space between all of said wires;

said pluralities of wires each being of given numerical quantities for a given sublength of said given cable length, said given numerical quantities being changed together progressively for progressive other given sublengths of said given cable length for producing a tapered strength caged armored cable; and

means for insulatively jacketing the multiple caged armored cable for protecting the cable, said jacketing means also filling the radial spaces located between the wires of said layers and preventing movement of one wire in any of said pluralities from appreciably moving with respect to any other wire in the same plurality of wires.

4,131,759
SLIP SLEEVE MECHANISM FOR A STRENGTH TAPERED CAGED ARMORED ELECTROMECHANICAL CABLE

Edward M. Felkel, Worcester, Mass., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Aug. 10, 1977, Ser. No. 823,252
Int. Cl.[2] H01B *17/22*
U.S. Cl. 174—107 10 Claims

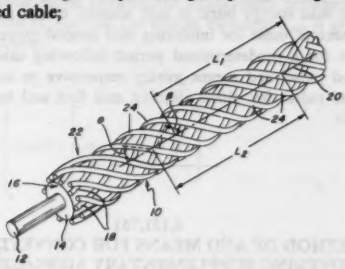
1. A multiple caged tapered strength armored electrical cable of a given length, said cable comprising:

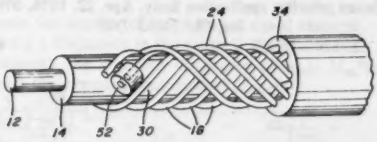
a core;

means covering said core for protecting the same;

a plurality of armored layers of wires located about said covering means, each armored layer being formed from a plurality of wires successively helically wound about the preceeding layer, the first layer being wound directly over said core, each of said plurality of wires in each layer being spaced from the adjacent two wires to form a radial space between all of said wires;

said pluralities of wires each being of given numerical quantities for a given sublength of said given cable length, said given numerical quantities being changed together progressively for progressive other given sublengths of said given cable length for producing a tapered strength caged armored cable;





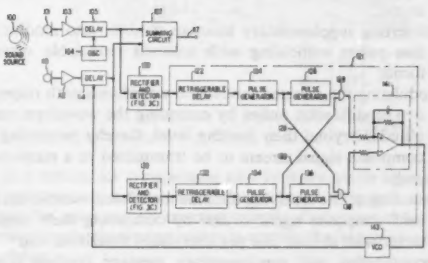
means, within which loose ends of said wires in said armored layers are placed, for retaining said loose ends while permitting their movement within said retaining means and for preventing said loose ends from migrating from the armored layer in which they are initially located; and

means for insulatively jacketing the multiple caged armored cable for protecting the cable, said jacketing means also filling the radial spaces located between the wires of said layers and preventing movement of one wire in any of said pluralities from appreciably moving with respect to any other wire in the same plurality of wires.

4,131,760
MULTIPLE MICROPHONE DEREVERBERATION SYSTEM

Susan W. Christensen, Tuxedo Park, N.Y., and Cecil H. Coker, Chatham, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 7, 1977, Ser. No. 858,418
Int. Cl.[2] H04B *15/00*
U.S. Cl. 179—1 P 22 Claims



1. A dereverberation circuit comprising an audio source,

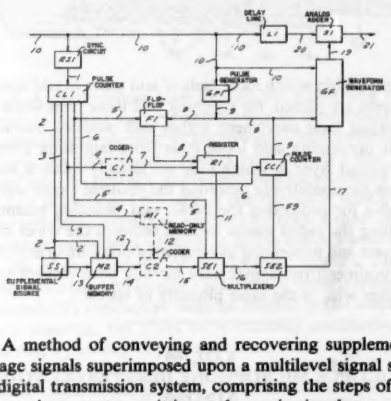
first and second sound detecting devices responsive to sounds from said source for producing first and second audio signals, respectively; means responsive to said first audio signal for generating a first pulse corresponding to an energy burst in said sounds; means responsive to said first pulse for inhibiting said first pulse generating means for a predetermined period following said generated first pulse; means responsive to said second audio signal for generating a second pulse corresponding to said energy burst in said sounds; means responsive to said second pulse for inhibiting said second pulse generating means for a predetermined period following said generated second pulse; and means jointly responsive to said first and second pulses for phase aligning said first and second audio signals.

4,131,761

METHOD OF AND MEANS FOR CONVEYING AND RECOVERING SUPPLEMENTARY MESSAGE SIGNALS SUPERIMPOSED UPON A MULTILEVEL SIGNAL STREAM IN A DIGITAL TRANSMISSION SYSTEM

Pietro P. Giusto, Turin, Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni, Turin, Italy

Filed Apr. 22, 1977, Ser. No. 790,071
Claims priority, application Italy, Apr. 22, 1976, 67961 A/76
Int. Cl.[2] H04J *7/00*
U.S. Cl. 179—15 BY **10 Claims**



1. A method of conveying and recovering supplementary message signals superimposed upon a multilevel signal stream in a digital transmission system, comprising the steps of:

generating, at a transmitting end, a main signal stream consisting of waveforms occurring during consecutive clock cycles and carrying information in the form of amplitude variations among a plurality of levels including two limiting levels and at least one intermediate level;

monitoring said main signal stream to find modulable waveforms with amplitudes on at least one of said limiting levels;

converting supplementary message symbols into modification pulses coinciding with selected modulable waveforms;

modulating the selected modulable waveforms with respective modification pulses by extending the waveform amplitudes beyond their limiting level, thereby producing a composite signal stream to be transmitted to a receiving end;

detecting, at the receiving end, the modulated waveforms of said composite signal stream by comparing their amplitudes with at least one predetermined threshold; and

reconstituting said supplementary message symbols from demodulation pulses derived from the detected modulated waveforms.

4,131,762

BUFFER STORAGE ASSIGNMENT ARRANGEMENT FOR TIME-DIVISION SWITCHING SYSTEMS

Anthony Reid, Chicago, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 16, 1977, Ser. No. 796,971
Int. Cl.[2] H04J *3/02*
U.S. Cl. 179—15 AQ **12 Claims**

1. In combination:

a plurality of data word sources;

a switching network, comprising a plurality of input terminals and a plurality of output terminals, for completing communication paths therebetween;

a plurality of buffer memories, each uniquely associated with one of said input terminals, for storing data words from said data word sources;

means for generating control signals defining two data word sources which are to intercommunicate; and

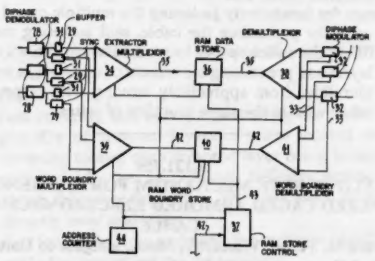
memory assignment means responsive to said control signals for storing data words from the two data word sources defined by said control signals in different ones of said buffer memories when data words from both of said data word sources would, in the absence of said control signals, be stored in the same one of said buffer memories.

4,131,763

BIT SWITCHING OF WORD SYNCHRONIZED DATA

Ludwik Herschtal, North Balwyn, Australia, assignor to L M Ericsson Pty. Ltd., Broadmeadows, Australia

Filed Sep. 16, 1977, Ser. No. 833,892
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS **5 Claims**



1. A method for serially bit-switching word synchronized digital data whereby the synchronization information is separated from its associated data word prior to switching, each data word is serially bit switched via a single data path to a required outlet and information relevant to said sychronization information is switched simultaneously with said associated data word, via a switch by-path, to said outlet to provide for appropriate re-combination of synchronization information with said related data word at said outlet, said word synchronized data being bi-polar or diphase modulated data and said

synchronization information being in-band and being a violation of said modulation, said synchronization information being separated from its associated data word by demodulating said data to provide nonreturn-to-zero data prior to switching.

4,131,764
ARRANGEMENT FOR CONVERTING DISCRETE SIGNALS INTO A DISCRETE SINGLE-SIDEBAND FREQUENCY DIVISION-MULTIPLEX-SIGNAL AND VICE VERSA

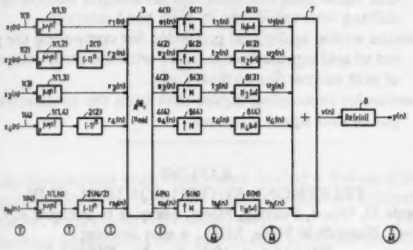
Theodoor A. C. M. Claasen, and Wolfgang F. G. Mecklenbrauker, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,652

Claims priority, application Netherlands, Apr. 4, 1977, 7703633

Int. Cl.[2] H04J 1/00

U.S. Cl. 179—15 FS **14 Claims**



1. An arrangement for converting N discrete baseband signals $\{x_k(n)\}$, (k = 1, 2, 3, . . . N) having associated therewith a sampling rate 1/T and a frequency spectrum $X_k(\omega)$, into a discrete baseband single-sideband frequency division-multiplex signal $\{y(n)\}$, (n = . . . −2, −1, 0, +1, +2, . .) having associated therewith a sampling rate 1/T which is at least equal to N/T and having associated therewith a frequency spectrum $Y(\omega)$, wherein

$$Y\left[\omega_o + (k-1)\frac{\pi}{T}\right] = X_k(\omega_o) \cdot \psi_k(\omega_o)$$

wherein the arrangement comprises:

means for receiving said baseband signals $\{x_k(n)\}$;

means for selectively modulating the received signals $\{x_k(n)\}$ for generating baseband signals $\{r_k(n)\}$;

a transformation device means for processing said baseband signals $\{r_k(n)\}$ for generating a plurality of discrete conversion signals $\{s_m(n)\}$, (m = 1, 2, 3, . . . N), said transformation device having associated therewith a transformer matrix A comprising the elements a_{mk} of a constant value, and which transformer matrix is unequal to the discrete Fourier transformer matrix, and wherein the relation between the components $s_m(n)$ and the components $r_k(n)$ is given by

$$s_m(n) = \sum_{k=1}^{N} a_{mk}\, r_k(n);$$

a plurality of signal channels to each of which one of the conversion signals is applied, and which each include discrete filtering means and sampling rate increasing means for generating discrete signals $\{u_m(n)\}$, the transfer function of the signal channel which is determined by said discrete filtering means being equal to $H_m(\omega)$;

means for forming a discrete sum signal

$$\sum_{m=1}^{N} u_m(n), \text{ wherein}$$

$$y(n) = \sum_{m=1}^{N} u_m(n);$$

wherein for each signal channel the relationship between its transfer function $H_m(\omega)$ and the matrix elements a_{mk} is given by FDM-condition

$$\frac{1}{2}\sum_{m=1}^{N}\left\{ a_{mk}H_m\left[\omega_o + (i-1)\frac{\pi}{T}\right] + a^*_{mk}H^*_m\left[\frac{2\pi}{T_y} - \left\{\omega_o + (i-1)\frac{\pi}{T}\right\}\right]\right\} = \delta_{ki}\psi_i(\omega_o)$$

wherein:

m represents the number of the relevant signal channel;

ω_o represents a frequency in the range $0 \leqq \omega_o < \pi/T$;

a_{mk}^* represents the complex conjugate of a_{mk}; $H_m^*(\omega)$ represents the complex conjugate of $H_m(\omega)$;

i = 1, 2, 3, . . . N;

$\delta_{ki} = 0$ for $k \neq i$

$\delta_{ki} = 1$ for k = i;

$\psi_i(\omega_o)$ represents an arbitrary function of ω_o.

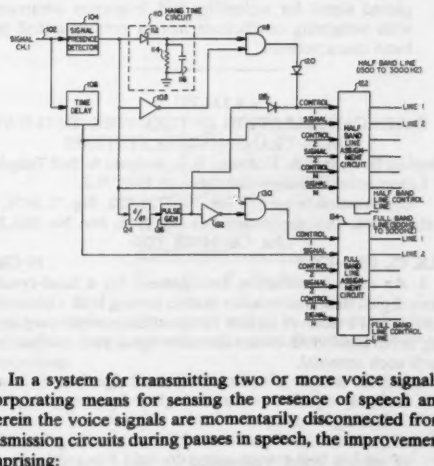
4,131,765
METHOD AND MEANS FOR IMPROVING THE SPECTRUM UTILIZATION OF COMMUNICATIONS CHANNELS

Leonard R. Kahn, 137 E. 36 St., New York, N.Y. 10016

Continuation-in-part of Ser. No. 713,046, Aug. 9, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,661

Int. Cl.[2] H04B 1/66

U.S. Cl. 179—15.55 R **12 Claims**



1. In a system for transmitting two or more voice signals, incorporating means for sensing the presence of speech and wherein the voice signals are momentarily disconnected from transmission circuits during pauses in speech, the improvement comprising:

(a) hang time means connected to the speech presence indication means, the hang time means in turn connected to and controlling switching circuitry that provides a sub-

stantially frequency limited transmission channel for transmission of unsensed consonant speech sounds that appear at ends of speech bursts; and,

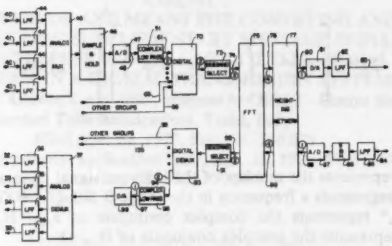
(b) means for delaying the speech waves for a period of time sufficient for a listener to hear initial unsensed consonant sounds, said delay means connected so that the speech waves are not delayed in reaching the (a) speech presence determination means but are delayed in reaching said switching circuitry.

4,131,766

DIGITAL FILTER BANK

Madihally J. Narasimha, Mountain View, Calif., assignor to Granger Associates, Menlo Park, Calif.

Filed Jul. 11, 1977, Ser. No. 814,303
Int. Cl.² H04J *1/00*
U.S. Cl. 179—15 FD **20 Claims**



1. A digital filter for use in a voice multiplexing system for modulating a series of data samples representing a number of voice channels in time division multiplexed format into a series of data samples representing said voice channels in frequency division multiplexed format comprising:

complex low pass filter means connected to receive said series of time division multiplexed data samples for converting said samples to an analytic signal for each of said voice channels,

Fourier transform processor means connected to receive each of said analytic signals for transforming said analytic signals into a frequency division multiplexed signal having frequency components corresponding to different ones of said voice channels and

weighting means connected to receive said frequency multiplexed signal for weighting said frequency components with weighting coefficients having predetermined passband characteristics.

4,131,767

ECHO CANCELLATION IN TWO-WIRE, TWO-WAY DATA TRANSMISSION SYSTEMS

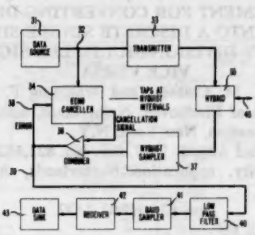
Stephen B. Weinstein, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 721,032, Sep. 7, 1976, abandoned. This application Feb. 22, 1978, Ser. No. 880,293
Int. Cl.² H04B *3/20*
U.S. Cl. 179—170.2 **10 Claims**

1. An echo cancellation arrangement for a baud-synchronous digital data transmission system having both a transmitter section and a receiver section for simultaneous two-way signaling at full bandwidth over a common signal path comprising at each such terminal,

means for sampling incoming received signals at a rate substantially equal to twice the highest frequency employed in said signal path,

an adjustable signal processor for compensating for echoes of signals being transmitted by said transmitter section into said receiver section having an input connected to a data source in said transmitter section and an output combined in subtractive relationship with the output signal from said sampling means to form a subtractive output having an error component, said signal processor storing consecutive discrete-level samples from said data source at baud intervals and shifting such samples through a sequence of storage locations at intervals no greater than the reciprocal of twice the highest frequency employed in



said signal path and such that an integral number of such shifting intervals occur in each baud interval,

means within said signal processor for computing the product of said consecutive samples with the error component of said subtractive output, and

means for recovering digital data from the subtractive output of said signal processor,

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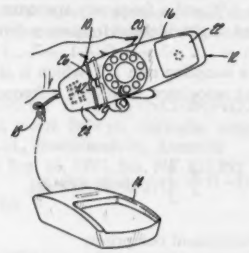
4,131,768

TELEPHONE SWITCH CONTROL CLIP

Reggie D. Wood, Pontiac, Mich., assignor to Richard A. Campbell, Bloomfield Hills, Mich., a part interest

Filed Oct. 4, 1976, Ser. No. 728,921
Int. Cl.² H01H *9/22*; H04M *1/03*
U.S. Cl. 179—178 **1 Claim**



1. A telephone switch control clip for attachment to a telephone instrument of the type having a hand-held telephone receiver unit including a push button for opening and closing the telephone circuit, the push button being in a normally extended position to close the telephone circuit, a cradle for receiving said hand-held telephone receiver unit and engaging said push button to move the same into a retracted position to open said telephone circuit, and a telephone wire connecting said hand-held receiver unit to said cradle; said clip consisting only of a one-piece member having a circular contour closely following the peripheral shape of a selected portion of said receiver and slidably movable along the longitudinal length of said receiver between a first position engaging the push button to open said circuit and a second position disengaged from said push button to close said circuit;

said clip having an inward projection formed on a portion thereof adjacent said push button when said clip is attached to said receiver unit, said projection engaging said push button when said clip is moved along said receiver to a position above said push button, said clip having a base member, a portion of which includes said inward projection for engaging said push button of said hand-held re-

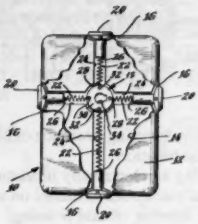
ceiver unit; said clip further comprising a pair of curved legs adapted to engage the outer peripheral surface of said hand-held receiver unit, said legs ending in opposing portions which are spaced apart a sufficient distance to permit said telephone connecting wire to pass between said opposing ends, said spaced apart portions being diametrically opposite said inward projection.

4,131,769

TELEPHONE LOCK

Sylvia Davis, 2100 First Ave., New York, N.Y. 10029

Filed Sep. 1, 1977, Ser. No. 829,629
Int. Cl.[2] H04M *1/66*
U.S. Cl. 179—189 D 4 Claims



1. In combination with a telephone having a dialing apparatus surrounded on the perimeter thereof by a notch delineating a window, a telephone lock comprising:

a housing adapted to cover said dailing apparatus and forming a chamber therein, said housing separably registering with said window and having a plurality of slots disposed in the edges thereof and a central aperture disposed therethrough;

a plurality of engaging elements disposed within said chamber and selectively extendable and retractable through said slots and spring urged to extended positions, said engaging elements when in an extended position engaging said slot and when in a retracted position, disengaging said notch and

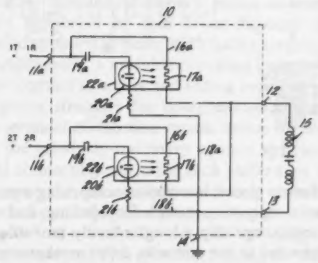
lock means disposed within said central aperture for urging said engaging elements into said retracted position when operated by a key.

4,131,770

COMMON BELL RINGING APPARATUS FOR MULTIPLE BUTTON KEY TELEPHONE SET

William J. Dick, 188-20A 69th Ave., Flushing, N.Y. 11365

Filed Jun. 29, 1977, Ser. No. 811,173
Int. Cl.[2] H04M *1/26*
U.S. Cl. 179—84 L 6 Claims



1. An apparatus for selectively controlling the energization of an output circuit with an electrical signal of given character from one of a plurality of input circuits, comprising:

a plurality of input terminals adapted to be connected to said input circuits, respectively,

an output terminal adapted to be connected to said output circuit,

a common terminal for said input and output circuits,

a first plurality of circuit means connected between said common terminal and said input terminals, respectively, each responsive only to an electrical signal of said given character and each having current responsive radiant energy emitting means therein, and

a second plurality of circuit means connected between said output terminal and said input terminals, respectively, and each having radiant energy responsive current controlling means therein,

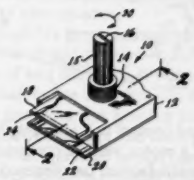
each of said radiant energy responsive controlling means having electrical conductivity adapted to change from a given value to a different value responsive, respectively, to radiant energy from a corresponding current responsive radiant energy emitting means in said first plurality of circuit means, whereby the application of electrical signals of said given character selectively to said input circuits is effective to change the electrical conductivity of the corresponding radiant energy responsive current controlling means from said given value to said different value for controlling the energization of the output circuit.

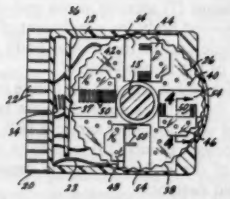
4,131,771

ROTARY SWITCH WITH SPACED CIRCUIT BOARDS AND DISCRETE CONTACTS ON ROTOR OPPOSITE FACES ELECTRICALLY INSULATED FROM FURTHERMOST BOARD

Richard W. Erickson, Glendora; James Pallaske, Covina, and Stephen Talbert, Pasadena, all of Calif., assignors to Becton, Dickinson Electronics Company, Pasadena, Calif., by said Richard Erickson and James Pallaske

Filed Apr. 6, 1977, Ser. No. 785,076
Int. Cl.[2] H01H *19/58*
U.S. Cl. 200—11 DA 8 Claims





1. A multiple position rotary switch in a housing having an area defined in two mutually orthogonal directions, said switch comprising:

switch contact means for selectively closing electrical circuits upon contact, said means including an electrically insulating rotatable wheel extending substantially across said area substantially dividing said housing into a first section and a second section having first and second sides and having mounting means on both said first and second sides for selectively attaching a plurality of contact brush sets electrically isolated from each other;

a first printed circuit board positioned stationary relative to the wheel in said first housing section, said first board having electrical conductors positioned thereon facing the said first wheel side, the said circuits of said board being adapted to be closed selectively upon contact of said conductors with the brush sets on said wheel; and

a second printed circuit board positioned stationary relative to the wheel in said second housing section, said second board having electrical conductors positioned thereon facing the said second wheel side, said circuits of said second board being adapted to be closed selectively upon contact of said conductors with the brush sets on said wheels;

wherein said first wheel side substantially covers said electrical conductors positioned on said first printed circuit board, and said second wheel side substantially covers said electrical conductors positioned on said second printed circuit board to isolate any electrical connection of said first board from brushes on said second wheel side, and to isolate any electrical connection of said second board from brushes on said first wheel side.

4,131,772
SWITCHBOX AND CONTROL UNIT ASSEMBLY FOR AUTOMOTIVE VEHICLES

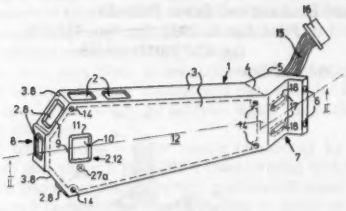
Albert Weckenmann, Ahrensburg; Rolf Bräuticam, and Lothar Haas, both of Nüremberg, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 28, 1977, Ser. No. 772,521

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1976, 2613525

Int. Cl.² H01H 9/00; B60K 35/00

U.S. Cl. 200—61.54 **33 Claims**



1. Switchbox and control unit assembly for positioning operating switches of a motor vehicle comprising

an elongated, multi-faceted cantilevered hollow body structure (1) of essentially polygonal cross section adapted for freely projecting, cantilevered mounting in the motor vehicle;

attachment means (7) secured at the end of said free standing, cantilevered body for attachment of said body to the motor vehicle and to locate said body spaced from the dashboard of the motor vehicle;

a plurality of switches adapted for tactile operation (2, 2.12) located in the surfaces defined by the facets of the body and formed with touching surfaces (10);

surface supported circuits (13) located in the space defined interiorly of the hollow body (1) connected to at least some of said switches;

and a connection cable (15) passing out of the hollow body in the region of the attachment means, the connection cable being connected interiorly of the body to at least some of the surface supported circuits;

a printed circuit board (22) within the interior space defined by the hollow body, the printed circuit board being electrically connected to said connecting cable (15) and providing for electrical interconnection of the surface supported circuits (13) and of the switches (2) to said connecting cable;

and a separable multi-terminal connector (16) electrically and mechanically secured to the connecting cable (15) and forming the electrical output terminal for the switches and the surface supported circuits in the hollow body.

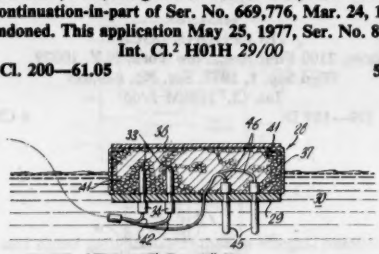
4,131,773
APPARATUS FOR DETECTING PRESENCE OF OIL IN A BODY OF WATER

Robert M. Maham, Beaumont, Tex., and Matthew D. Beasley, Plainsboro, N.J., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 669,776, Mar. 24, 1976, abandoned. This application May 25, 1977, Ser. No. 800,368

Int. Cl.² H01H 29/00

U.S. Cl. 200—61.05 **5 Claims**



5. Apparatus for detecting presence of oil in a body of water, comprising in combination

a housing having an electrically insulating material base and a first pair of electrodes mounted on said base and extending into the interior of said housing,

a pervious exterior on said housing for permitting free passage of said water therethrough,

said housing interior containing a plurality of oleophilic beads covering and contacting all of the exposed surfaces of said first pair of electrodes,

a second pair of electrodes mounted on said base and extending outside of said housing into said body of water, and

a pair of insulated flexible electric conductors connected to each of said pairs of electrodes for making electrical circuit connections therewith,

said apparatus combination being lighter than water and being designed for floating with said pervious exterior at least partially submerged.

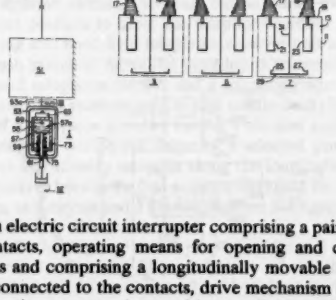
4,131,774
CIRCUIT INTERRUPTER OPERATING MECHANISM

Ronald W. Crookston, Trafford, and Thomas N. Meyer, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 9, 1977, Ser. No. 831,722

Int. Cl.² H01H 35/38

U.S. Cl. 200—82 B **1 Claim**



1. An electric circuit interrupter comprising a pair of separable contacts, operating means for opening and closing the contacts and comprising a longitudinally movable link operatively connected to the contacts, drive mechanism for driving the operating means and comprising a cylinder and piston, the piston having a piston rod extending from the cylinder on a side opposite the operating means, generator means for generating a sudden expulsion of gaseous medium into the cylinder

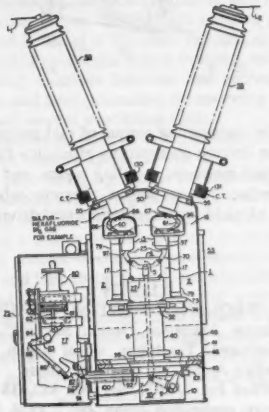
and against the piston, the piston being actuable by the gaseous medium to drive the operating means between open and closed positions of the contacts, the piston rod being substancially in movable planar alignment with the movable link and being movable longitudinally from the end of the cylinder opposite said movable link, a connecting link directly connected at one end to the piston rod and indirectly connected to the movable link at the other end, and the connecting link extending around the cylinder.

4,131,775

COMPRESSED-GAS CIRCUIT-INTERRUPTERS OF THE PUFFER-TYPE HAVING IMPROVED SUPPORTING, SHIELDING AND ASSEMBLY FEATURES

Jeffry R. Meyer, Penn Hills, and Robert L. Hess, North Versailles, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 4, 1976, Ser. No. 738,803
Int. Cl.[2] H01H *33/02, 33/24, 33/88*
U.S. Cl. 200—148 R **22 Claims**



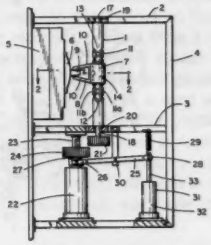
1. A compressed-gas, puffer-type, circuit-interrupting assemblage comprising a pair of laterally-disposed modular-type puffer interrupting units, each puffer interrupting unit comprising a relatively-stationary contact structure and a separable movable contact structure, means defining a side-insulating baffle-plate for each puffer-type interrupting unit for fixedly supporting the stationary and movable contact structures in a predetermined vertically, spaced-apart relationship, means defining a relatively-heavy lower metallic supporting plate, means securing each of said side insulating baffle-plates to said relatively-stationary lower-disposed metallic supporting plate, a relatively-stationary piston structure for each puffer unit, each respective relatively-stationary piston structure being upstandingly supported by said lower-disposed relatively-heavy metallic supporting plate, each puffer interrupting unit including, additionally, a movable operating cylinder carrying said movable contact structure and sliding over said relatively-stationary piston structure for compression of gas therebetween, line-terminal connection means, means for electrically connecting the relatively-stationary contact structure to said line-terminal connecting means for each puffer-type interrupting unit, a generally horizontially-extending cross-bar structure mechanically and electrically connecting the two movable operating cylinders, a vertically-movable insulating operating rod pivotally connected by a spherical bearing to said horizontally-extending cross-bar structure, whereby compensation is obtained for manufacturing inaccuracies and for providing proper alignment of vertical motion of the two laterally-spaced operating cylinders.

4,131,776

MOTORIZED DRIVE ASSEMBLY FOR A CIRCUIT BREAKER OPERATOR

Frank T. Ehrenberger, Iowa City, Iowa, assignor to Square D Company, Park Ridge, Ill.

Filed Oct. 14, 1976, Ser. No. 732,242
Int. Cl.[2] H01B *3/40*
U.S. Cl. 200—158 **5 Claims**



1. A motor driven assembly in combination with a circuit breaker adapted to interrupt a circuit in response to a fault condition in said circuit and having an operator handle with opposing faces pivotable in one direction about one axis from an ON position to a TRIP position in response to a fault condition and pivotable in said one direction from said Trip position to a Reset position whereafter said operator is pivotable in the opposite direction from said Reset position to said ON position to enable restoration of said circuit, comprising:

a motor having a motor shaft rotatable in only one direction about a second axis transverse to said one axis,

a follower shaft rotatable independently of said motor shaft about a third axis parallel to said second axis and having a pair of oppositely wound axially extending intersecting helical grooves formed in the surface of said follower shaft with said grooves having a reversing juncture at opposite ends of each groove,

follower means rotatably mounted on said follower shaft and coupled with one of said grooves to move in a respective axial direction of said third axis in response to rotation of said follower shaft in one direction and thereafter coupled with the other groove at one housing juncture to move in the opposite axial direction of said third axis in response to rotation of said follower shaft in said one direction whereafter said follower means is coupled with said one groove by the other reversing juncture,

means extending from said follower means radially of said first axis and transversely to the axis of said follower shaft engaging each face of said operator handle to move said follower in said one direction for rotating said follower shaft in response to pivoting of said operator handle from said ON position to said TRIP position and thereafter operable to pivot said operator handle from said TRIP position to said RESET position in response to movement of said follower means in said respective axial direction of said third axis and to thereafter pivot said operator handle from said RESET position to said ON position in response to movement of said follower means in the opposite axial direction of said third axis with said operator handle moving radially relative said third axis,

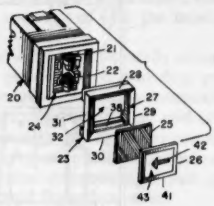
a first gear rotatable with one of said shafts and movable axially of said one shaft in selected directions, a second gear rotatable with the other of said shafts and adapted to engage said first gear to rotate with said first gear in response to a selected axial movement of said first gear to engage said second gear,

and electrically operable means to move said first gear axially of said one shaft to engage said gears for moving said follower and operator handle in response to rotation of said motor shaft.

4,131,777
PUSHBUTTON ELECTRICAL SWITCHES AND PUSHBUTTONS THEREFOR

James R. Bailey, Chicago, and Vernon W. Lavigne, Rolling Meadows, both of Ill., assignors to Switchcraft, Inc., Chicago, Ill.

Filed Feb. 18, 1977, Ser. No. 769,894
Int. Cl.[2] H01H 9/00
U.S. Cl. 200—311 3 Claims



1. An illuminated pushbutton electrical switch comprising:
(a) an electrical switch,
(b) a source of illumination disposed forwardly of said switch of (a);
(c) a pushbutton which can be pushed to actuate said switch of (a) and which is disposed forwardly of said source of illumination of (b), said pushbutton comprising a hollow housing with an open front face and sides extending inwardly from said face to an open rear end, said face constituting a frame adapted to receive and retain one or more separate flat sheet-like inserts, and
(d) one or more separate transparent or translucent, resilient flat sheet-like inserts mounted in said frame so as to be illuminated by said source of illumination of (b), said frame in said face of said pushbutton of (c) being rectangular, two opposing sides of said housing being undercut to form lips adjacent said face and the other two opposing sides of said housing containing inwardly extending supports for said inserts, said supports being opposite one another and spaced inwardly from said lips so as to retain said inserts between the inner sides of said lips and the upper sides of said supports, whereby said inserts can be inserted or changed through said front face by flexing them between said lips.

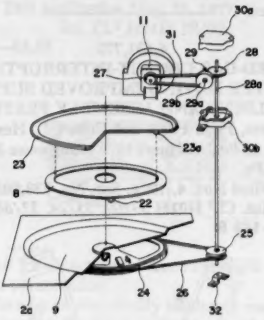
4,131,778
MICROWAVE OVEN

Junzo Tanaka, Fujiidera, and Toshio Kai, Yamatokoriyama, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Feb. 28, 1977, Ser. No. 773,118
Claims priority, application Japan, Mar. 4, 1976, 51-24472; Apr. 15, 1976, 51-43109; Mar. 22, 1976, 51-34801[U]; Sep. 1, 1976, 51-105323
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 F 9 Claims

1. A microwave oven which comprises;
(a) an oven defining structure,
(b) a heating cavity defined by walls within said oven defining structure,
(c) door means adapted to selectively open and close an access opening defined at one side of said heating cavity,
(d) means for supplying microwave energy into said heating cavity,
(e) rotary table means rotatably disposed on the upper surface of a bottom wall of said heating cavity for holding an object to be heated thereon and adapted to rotate about a rotational axis,
(f) a rotary member rotatably disposed adjacent to a lower surface of the bottom wall of said heating cavity and said rotary table means,
(g) means for magnetically coupling said rotary table means with said rotary member,
(h) a driving motor and reduction gear means associated with said rotary member for driving said rotary member, said driving motor has a starting torque τ_M according to the formula:

$$\tau_T < \tau_M \times 1/X \times \eta$$

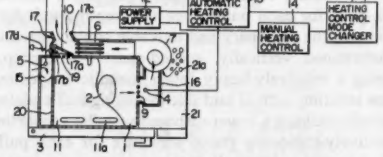


where τ_T is the transmitting torque of said magnetic coupling means, η is the driving transmitting efficiency from said driving motor to said magnetic coupling means, and X is the gear ratio of said reduction gear means, whereby when the rotary table means is blocked against rotation, said driving motor will run.

4,131,779
HIGH-FREQUENCY HEATING APPARATUS

Osami Tatsukawa, Matsudo; Osamu Sakurai, Ibaraki, and Hisayuki Serizawa, Tsuchiura, all of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Japan

Filed Jul. 6, 1977, Ser. No. 813,418
Claims priority, application Japan, Jul. 7, 1976, 51-80627; Jul. 21, 1976, 51-86884[U]; Jul. 21, 1976, 51-97038
Int. Cl.[2] H05B 9/06
U.S. Cl. 219—10.55 R 21 Claims



1. A high-frequency heating apparatus comprising:
a housing;
a heating chamber formed in said housing for accommodating an object to be heated, said heating chamber being defined by walls which surround said heating chamber and are formed with a first opening for taking in and out the object;
a door supported by said housing openably and closably and sealing said first opening against high-frequency energy when closed;
means for generating high-frequency energy to feed it into said heating chamber;
means connected to said high-frequency energy generating and feeding means to control the generation of the high-frequency energy and the amount of supply of the same;
first heating time controlling means including means for detecting temperature of the object which is accommo-

dated in said heating chamber and is being heated and actuating said high frequency energy supply controlling means when a detected signal of temperature reaches a predetermined value whereby the heating time is automatically controlled;

second heating time controlling means for manually controlling the heating time by actuating the high-frequency energy supply controlling means;

heating control mode changing means for selectively actuating one of said first and second heating time controlling means;

means for generating heat disposed inside said housing but outside said heating chamber;

a first ventilating path for ventilating said heating chamber including at one end a second opening provided at a part of at least one of said door and said housing, at the other end a third opening provided at a part of said housing and communicating with said second opening, and a space of said heating chamber between said second and third openings, said heat generating means being disposed at a part of said first ventilating path;

a second ventilating path for ventilating said heating chamber including at one end a fourth opening provided at a part of said housing, at the other end said second opening communicating with said fourth opening, and the space of said heating chamber between said second and fourth openings, said heat generating means being disposed at a part of said second ventilating path;

means for forcibly flowing air along selected one of said first and second ventilating paths; and

ventilating path changing means for selecting one of said first and second ventilating paths such that when said first ventilating path is selected by said changing means, atmospheric air is drawn by said air forcibly circulating means from said second opening, passed through said heating chamber and then through said heat generating means and driven out of said third opening and when said second ventilating path is selected, atmospheric air is drawn by said air forcibly circulating means, passed through said heat generating means and then through said heating chamber and driven out of said second opening.

4,131,780

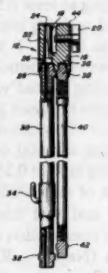
UNDERWATER CUTTING AND GOUGING TORCH

Harold J. Trabbold, and Jerry R. Hummel, both of Lancaster, Ohio, assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 687,940, May 19, 1976, abandoned. This application Nov. 11, 1977, Ser. No. 850,750

Int. Cl.[2] B23K *9/14*

U.S. Cl. 219—70 **4 Claims**



1. An underwater electric-arc cutting and gouging torch for use in the water-carbon arc cutting and gouging process comprising in combination:

an electrically insulating handle having an outer surface adapted to facilitate gripping by the hand of a user;

an electrically conductive torch head mounted on said handle said torch head including a recess so constructed and arranged to receive and clamp an elongated solid copper coated graphite cutting and gouging electrode which has its outer surface projecting beyond said clamp covered with a waterproof coating, and a passage in said head terminating in at least one nozzle-like aperture adjacent said recess each of said recess and said passage being elongated and having parallel longitudinal axes;

an insulating coating on all outwardly exposed surfaces of said head to prevent electrical shock to the user;

means for bringing electrical current from a source of such current to an electrode held in said recess; and

means for bringing water under pressure greater than that in the environment where the torch is used to said passage whereby when said torch is used for cutting said water exits from said nozzle-like aperture at high pressure in a direction along one side of the length of and toward the projecting end of the electrode disposed in said recess and to an arc struck between said electrode and said workpiece.

4,131,781

SUBMERGED ARC WELDING PROCESS FOR NICKEL CONTAINING STEEL

Yoshinori Ito, and Mutsuo Nakanishi, both of Amagasaki, Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Mar. 18, 1977, Ser. No. 778,973

Int. Cl.[2] B23K *9/18*

U.S. Cl. 219—73 **11 Claims**

1. A submerged arc welding process for welding nickel containing steel with a welding electrode in the presence of a flux, said welding process being characterized in that;

A. said welding electrode is a cored wire consisting of a mild steel and core material, the core material including, on the basis of weight to the total weight of the welding electrode, 5 to 25 percent of CaF_2, 2.5 to 5.5 percent of nickel, 0 to 0.5 percent of Mo, 0 to 0.5 percent of Ti, and

B. said flux is a bond type flux having a composition of, by weight percent, 10 to 30 percent of SiO_2, 8 to 20 percent Al_2O_3, 25 to 45 percent of MgO, 10 to 30 percent of CaO, 7 to 20 percent of CaF_2, and at least one member selected from the group consisting of metallic Si, Fe-Si, and Fe-Si-Mn in an amount of 0 to 0.6 percent calculated in term of metallic Si, and having a basicity B higher than 1.5, the basicity being defined on the basis of weight by the following equation;

$$B = (CaO + MgO)/(SiO_2 + Al_2O_3)$$

4,131,782

METHOD OF AND APPARATUS FOR MACHINING LARGE NUMBERS OF HOLES OF PRECISELY CONTROLLED SIZE BY COHERENT RADIATION

Bernard C. Einstein, Bern, and Peter Spring, Thun, both of Switzerland, assignors to Lasag AG, Thun, Switzerland

Filed May 3, 1976, Ser. No. 682,409

Int. Cl.[2] H01S *3/09*

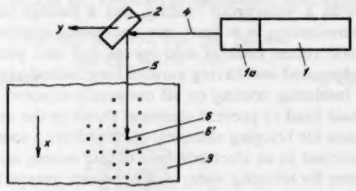
U.S. Cl. 219—121 LM **17 Claims**

1. A method of machining a plurality of cells on a continuously moving intaglio printing form thereby forming a pattern on said intaglio printing form wherein each cell machined defines a cell volume and the volume of the cells varies on said intaglio printing form, said method comprising:

pulse modulating a coherent radiation source according to the pattern; and

directing the modulated coherent radiation from said source successively onto said intaglio printing form for machin-

ing the plurality of cells while maintaining a zero velocity between the continuously moving intaglio printing form



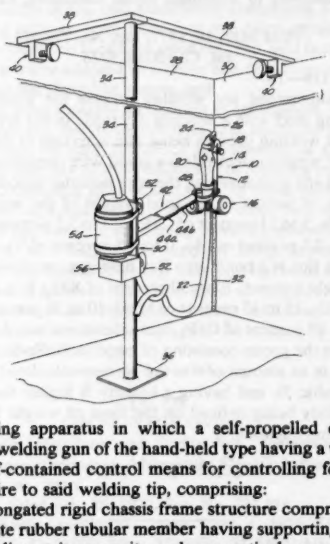
and the coherent radiation during machining of each of the plurality of cells.

4,131,783

WELDING APPARATUS

Milo M. Kensrue, 56 Linda Isle, Newport Beach, Calif. 92660, and Donald L. Martin, 12132 Woodlawn Ave., Santa Ana, Calif. 92705

Filed Jan. 31, 1977, Ser. No. 763,812
Int. Cl.[2] B23K *9/12*
U.S. Cl. 219—124.31 **23 Claims**



1. Welding apparatus in which a self-propelled carriage supports a welding gun of the hand-held type having a welding tip and self-contained control means for controlling feed of a welding wire to said welding tip, comprising:

(a) an elongated rigid chassis frame structure comprising an elongate rubber tubular member having supporting wheel assemblies at its opposite ends respectively mounting a pair of wheels adapted to be positioned on opposite sides of a weld line;

(b) power means including a motor mounted within said tubular member, said motor having a drive shaft extending longitudinally of said tubular member and a driving connection with one of said wheel assemblies to propel said carriage along said weld line;

(c) a welding gun of the self-contained hand-held type and means contacting said welding gun at spaced locations on said gun for releasably supporting said hand-held welding gun as a unit in a position extending generally above and longitudinally of said tubular member, said hand-held gun serving as a hand-grip for holding the apparatus in an operative position and moving the apparatus during a manual welding operation, said hand-held gun being supported for lateral swinging movement with its welding tip in an operating position relative to said line of weld, said means supporting the welding gun comprising a cradle pivotally mounted on said chassis frame structure for lateral swinging movements;

(d) means including the other of said wheel assemblies for guiding the carriage movement with respect to said weld line, the other one of said wheel assemblies being located beneath said tip of said welding gun and having the wheels thereof closely adjacent both sides of said weld line for accurately aligning said welding gun tip on said weld line, so that said wheel assemblies stabilize said welding gun; and

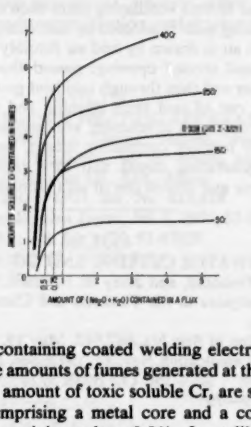
(e) a driving connection between said power means and said cradle for swinging said cradle and to impact oscillatory movement of said welding tip transversely of said weld line during propelled movement of the carriage by said power means.

4,131,784

COATED WELDING ELECTRODE CONTAINING CHROMIUM

Shinji Kimura, Kamakura; Tomokazu Godai, Fujisawa; Shoji Minato, Fujisawa; Minoru Kobayashi, Fujisawa; Makoto Yamaga, Fujisawa; Shingo Maki, Fujisawa; Yoshizo Hashimoto, Fujisawa; Tetsuo Suga, Fujisawa, and Hiroshi Saita, Fujisawa, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed Mar. 23, 1977, Ser. No. 780,495
Claims priority, application Japan, Mar. 23, 1976, 51/32337
Int. Cl.[2] B23K *9/24, 35/00*
U.S. Cl. 219—137 WM **8 Claims**



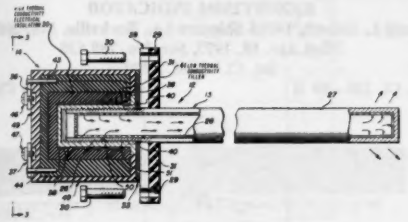
1. A chromium-containing coated welding electrode, characterized in that the amounts of fumes generated at the welding step, especially the amount of toxic soluble Cr, are suppressed and minimized, comprising a metal core and a coating flux composition, and containing at least 0.5% of metallic Cr based on the total weight of said welding electrode and less than 1% of Na and K calculated as ($Na_2O + K_2O$) based on the total weight of said coating flux composition.

2. A chromium-containing coated welding electrode, characterized in that the amounts of fumes generated at the welding step, especially the amount of toxic soluble Cr, are suppressed and minimized, comprising a metal core and a coating flux composition and containing at least 0.5% of metallic chromium based on the total weight of said welding electrode in at least one of said metal core and said coating flux composition, wherein said coating flux composition contains less than 1% of Na and K calculated as ($Na_2O + K_2O$) based on the total weight of said coating flux composition, and wherein said coating flux composition is formed using a colloidal solution in which a dispersed phase containing at least one member selected from the group consisting of oxides of Si, Al, Zr, B, P, Ti, Mg, Ca, Th and Fe occupies 1 to 90% by weight of the total solution as a binder, and application of the coating is followed by a drying step to form said coating flux composition.

4,131,785
ELECTRICALLY HEATED LIQUID TANK EMPLOYING HEAT PIPE HEAT TRANSFER MEANS

James R. Shutt, Reston, Va., assignor to Electro-Therm, Inc., Laurel, Md.

Filed Feb. 18, 1976, Ser. No. 659,071
Int. Cl.[2] H05B 3/82; F24H 1/20; F28D 13/00
U.S. Cl. 219—326 24 Claims

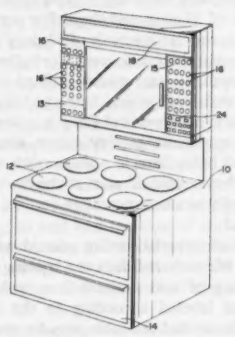


1. A heating apparatus for applying heat to the interior of a substantially closed container containing a liquid therein to be heated, comprising: a modular, removable heat transfer member having a heat absorbing end and a heat transmitting end and having high conductivity with a low temperature differential between the ends thereof, mounting means for removably mounting said heat transfer member on the exterior wall surface of a container with said heat absorbing end positioned exterior of the container and said heat transmitting end positioned to apply heat to the liquid within the container, and modular, removable, electrical heat producing means including an electric heating coil positioned about and removably secured to said heat absorbing end of said heat transfer member exterior of the container, whereby said heat transfer member and said heat producing means can be removed from the container and replaced, said electric heating coil being embedded in a high thermal conductivity, low electrical conductivity filler material which is surrounded by a low conductivity insulating jacket and which is received around a metal core member which is removably secured to said heat absorbing end of said heat transfer member.

4,131,786
REMOTELY CONTROLLABLE ELECTRIC OVEN

James Cooper, 2802 Hollywood Rd., Falls Church, Va. 22043

Filed Sep. 8, 1976, Ser. No. 721,399
Int. Cl.[2] H05B 1/02
U.S. Cl. 219—487 3 Claims



1. In a system for controlling and monitoring an electric oven having a plurality of heating locations within a substantially common housing for controllably heating foodstuff thereat for selected durations comprising:

a. first control panel means mounted within said common housing including,
   1. temperature selection means for selecting the heating temperature at each of said heating locations,
   2. timing means for setting the heating duration at each of said heating locations, and
   3. display means for illustrating the selected heating duration of each of said respective heating locations set by said timing means and the time remaining of each of said selected heating durations;

b. second control panel means separate and apart from said common housing and said first control panel means and movable with respect thereto, said second control panel means including,
   1. timing means for setting the heating duration at each of said heating locations, and
   2. display means for illustrating the heating duration selected either by said timing means in said first control panel means or said timing means in said second control panel means and the time remaining of each of said selected heating durations;

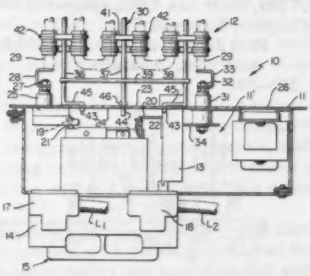
switching means for selectively turning said respective heating locations ON and OFF in response to signals from either of said timing means; and

communication means between said first and second control panel means for transmitting data from said timing means of said second control panel means to said electric oven and transmitting data from said first control panel means to the display means of said second control panel means.

4,131,787
ELECTRICAL HEATER CONSTRUCTION

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 15, 1977, Ser. No. 806,846
Int. Cl.[2] H05B 3/06
U.S. Cl. 219—532 10 Claims



1. In an electrical heater construction having a substantially closed housing means containing control means therein and having bracket means carrying electrical heater means externally thereof, said housing means having connection means detachably interconnected to said heater means externally to said housing means and electrically interconnecting said electrical heater means to said control means to be operated thereby, the improvement wherein said housing means has externally accessible detachable means and said bracket means has detachable means detachably interconnected to said detachable means of said housing means in a manner that is accessible externally to said housing means whereby said detachable means of said bracket means can be detached from said detachable means of said housing means without access to the interior of said housing means so that said heater means can be detached from said housing means without requiring the opening of said housing means.

4,131,788

ELECTRIC HEATER

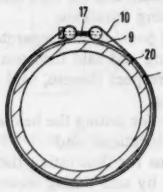
William J. Fulbrook, Chingbord, England, assignor to Hedin Limited, London, England

Filed Apr. 21, 1977, Ser. No. 789,704

Claims priority, application United Kingdom, Apr. 28, 1976, 17309/76

Int. Cl.² H05B 5/38

U.S. Cl. 219—535 **4 Claims**



1. An electric heater comprising a sheet-like elongate heating element having first and second mutually opposite major surfaces; a metallic housing member covering the first major surface of the element; a continuous closed loop band of flexible metal strip the majority of the length of which comprises two parallel confronting substantially equal length portions, the remainder comprising two rounded portions interconnecting the parallel portions, the band being situated on the opposite side of the element to the housing member and one of the parallel portions covering the second major surface of the element and being slidably attached to the housing member; and means located at the rounded portions of the band to urge the rounded portions together when the heater is positioned, in use, round a body to be heated, the housing member then being in thermal contact with the body.

4,131,789

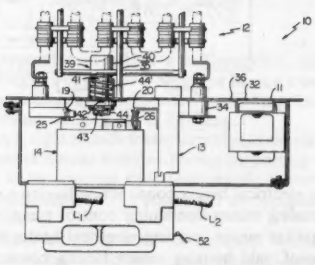
ELECTRICAL HEATER CONSTRUCTION

Hugh J. Tyler, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jun. 20, 1977, Ser. No. 808,269

Int. Cl.² H05B 3/06

U.S. Cl. 219—541 **10 Claims**



1. In an electrical heater construction having electrical heater means carried by frame means and having a lead unit movably carried by said frame means and having lead means directly and electrically interconnected to terminal means of said heater means when said unit is in one position relative to said frame means, said frame means having terminal means for electrically interconnecting said lead means to said unit to power source leads so that said power source leads will be directly and electrically interconnected to said terminal means of said heater means by said lead means when said unit is in said one position thereof, the improvement comprising movable latch means carried by said frame means and being operatively associated with said unit to latch said unit in an out position thereof when said unit is moved out of said one position thereof to said out position to disconnect said lead means from said terminal means of said heater means whereby said unit cannot be moved in any direction from said out position thereof until said unit is unlatched from said latch means by said latch means being manually moved to an unlatching position thereof.

4,131,790

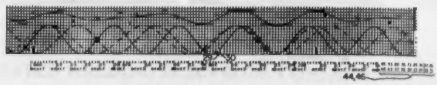
BIORHYTHM INDICATOR

Donald L. Rebsch, 14016 Shippers La., Rockville, Md. 20853

Filed Apr. 18, 1977, Ser. No. 788,435

Int. Cl.² G06C 3/00

U.S. Cl. 235—89 R **11 Claims**



1. A device for use in indicating the three basic biorhythm cycles, of a physical cycle having a first fixed repeat pattern cycle starting from birth, a sensitive cycle having a second different fixed repeat pattern cycle starting from birth and an intellectual cycle having a third different fixed repeat pattern cycle starting from birth, all in correlation with a daily calendar for a specific birth date, comprising:

a first sheet of material having printed on only one surface a planar graph having a plurality of parallel vertical day lines with equal spaces therebetween representing a fixed multiple of a day, and a horizontal line representing average. biorhythmic tendencies;

a first curve fixed directly on said one surface starting from said horizontal line, extending above said horizontal line, returning to said horizontal line, extending below said horizontal line, and returning to said horizontal line in a fixed pattern of 23 days and thereafter serially repeating said pattern at regular intervals of 23 days of said vertical day lines to represent the physical biorhythmic cycle;

a second curve fixed directly on said one surface starting from said horizontal line, extending above said horizontal line, returning to said horizontal line, extending below said horizontal line, and returning to said horizontal line in a fixed pattern of 28 days and thereafter serially repeating said pattern at regular intervals of 28 days of said vertical lines to represent the sensitive biorhythmic cycle;

a third curve fixed directly on said one surface starting from said horizontal line, extending above said horizontal line, returning to said horizontal line, extending below said horizontal line, and returning to said horizontal line in a fixed pattern of 33 days and thereafter serially repeating said pattern at regular intervals of 33 days of said vertical lines to represent the intellectual biorhythmic cycle;

a plurality of birthday year markings fixed directly on said one surface, with said vertical lines and being numbered at year intervals of said vertical lines in order;

said birthday year markings, first curve, second curve and third curve all being fixed in a phase relationship such that if extended they would all start at the horizontal line and move upwardly at a common start vertical line representing birth; and

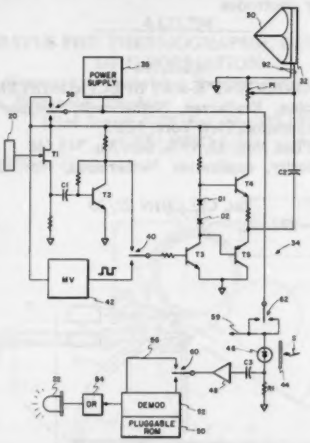
a second sheet of material having printed on only one surface, a table of numbered days at a spacing corresponding to the spacing of said vertical lines and consecutively arranged and labeled according to the months of the calendar year, so that the table may be vertically aligned with the graph adjacent the curves in a position such that a birthdate represented by a day and month indication of the table may be vertically aligned with the corresponding birthday year marking on said graph vertically spaced adjacent the curves.

4,131,791

SEARCH AND LOCATE SYSTEM

Louis J. Lego, Jr., Sauquoit, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,565
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 1 Claim



1. In a search and locate system wherein a search station transmits radiation from a search beacon having a large beam-width which is modulated in accordance with a predetermined pulse code, locator means for identifying the position of an operator to be located comprising, in combination:

detector means for sensing the radiation of said search beacon and for producing a detection output in respnse thereto;

means for demodulating said detection output to reproduce said pulse code;

means for storing a predetermined pulse code;

means for comparing said stored code with said reproduced code and for generating a comparison output in response to a match condition;

means responsive to said comparison output for generating an indication signal to indicate to said operator that said locator means is positioned in the path of the radiation of said search beacon;

a corner cube prism for reflecting a portion of the radiation of said search beacon back to said search station;

data input means manually operable by said operator for generating a data input signal; and

modulation means for modulating the amount of radiation reflected back to said search station by said corner cube prism in accordance with said data input signal whereby said locator means is adapted to send a data message to said search station via said reflected radiation,

said modulation means further including:

a microphone having a first terminal,

a first field effect transistor having a gate terminal, a first terminal and a second terminal, said gate terminal being connected to said first terminal of said microphone;

a first resistor having a first and a second end, said first end being connected to said first terminal of said first field effect transistor, and said second end being connected to ground;

a first capacitor having a first and a second end, said first end being connected to said first end of said first resistor;

a second resistor having a first and a second end, said first end being connected to said second end of said first capacitor;

a first transistor having a base, collector and an emitter terminal, said base terminal being connected to said first end of said second resistor, said emitter terminal being connected to ground;

a third resistor having a first and a second end, said first end being connected to said collector terminal of said first transistor and said second end being connected to aid second terminal of said first field effect transistor;

a first single pole double throw switch having a first, a second and a third terminal, said first terminal being connected to said first end of said third resistor;

a fourth resistor having a first and a second end, said first end being connected to said second terminal of said first single pole double throw switch,

a second transistor having a base, collector and emitter terminal, said base terminal being connected to said second end of said fourth resistor, and said emitter terminal being connected to ground;

a third transistor having a base, collector, and emitter terminal, said base terminal being connected to said collector terminal of said second transistor, and said collector terminal being connected to ground;

a second capacitor having a first and a second end, said first end being connected to said emitter terminal of said third transistor,

a fifth resistor having a first and a second end, said first end being connected to said emitter termminal of said third transistor,

a fourth transistor having a base, collector and emitter terminal, said emitter terminal being connected to said second end of said fifth resistor;

a first diode having an anode and a cathode end, said anode end being connected to said base terminal of said fourth transistor,

a second diode having an anode and a cathode end, said anode end being connected to said cathode end of said first diode, and said cathode end of said second diode being connected to said collector terminal of said second transistor;

a sixth resistor having a first and a second end, said first end being connected to said anode end of said first diode and said second end being connected to said second end of said third resistor; said second end of said sixth resistor also being connected to said collector terminal of said fouth transistor;

a first variable resistor having a first end, a second end and a middle terminal, said first end being connected to said collector terminal of said fourth transistor, said middle terminal being connected to said second end of said second capacitor, and said second end being connected to ground;

a shutter means positioned adjacent to said corner cube prism having a first and a second terminal, said first terminal being connected to said second end of said second capacitor and said second terminal being connected to ground;

a multivibrator means having an input terminal and an output terminal, said input terminal being connected to said second terminal of said first field effect transistor, said output terminal being connected to said third terminal of said first single pole double throw switch;

a power supply having a first and a second terminal, said first terminal being connected to ground; and

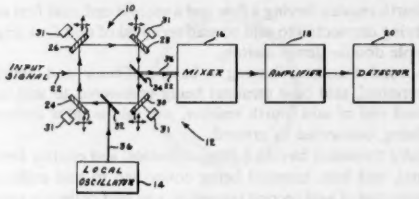
a second single pole double throw switch having a first, a second and a third terminal, said first terminal being connected to said input terminal of said multivibrator means, said second terminal being connected to said second terminal of said power supply and said third terminal being connected to said second terminal of said first field effect transistor; and

reflector means controllable by said operator for reflecting a portion of the radiation of said search beacon back to said search station.

4,131,792
FABRY-PEROT DIPLEXER

Howard Schlossberg, Lexington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 24, 1978, Ser. No. 871,864
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 16 Claims

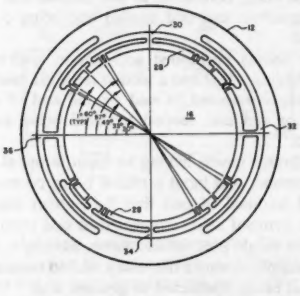


1. In a heterodyne receiver having a local oscillator, a mixer, and a detector, the improvement therein residing in a Fabry-Perot diplexer operably interposed between means for providing an input signal, said local oscillator and said mixer, said Fabry-Perot diplexer comprising a plurality of reflective elements optically aligned with one another and forming an optical path therebetween, first means located within said optical path for receiving and directing a signal emitted by said local oscillator into said optical path, second means located within said optical path for receiving said input signal and said local oscillator signal and directing said input signal and said local oscillator signal in a parallel and overlapping relationship to said mixer and the total length of said optical path of said diplexer being defined for non-resonance at the frequencies of said input signal and resonance at the frequency of said local oscillator signal whereby said input signal and said local oscillator signal directed to said mixer are substantially without loss.

4,131,793
LATERAL PHOTODETECTORS

Ronald G. Stoutmeyer, and William O. Alltop, both of China Lake, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washingtoon, D.C.

Filed Aug. 10, 1976, Ser. No. 713,570
Int. Cl.[2] H01L 31/02
U.S. Cl. 250—211 J 12 Claims



10. In a lateral photodetector having a front surface capable of receiving a point source of radiation as an input and an opposite rear surface capable of outputting a plurality of electrical currents representative of the point said radiation is inputted into said front surface, the method of improving the correspondence of said currents to the input point of said radiation comprising the steps of:

providing an annular boundary ring on said photodetector rear surface;

segmenting said annular boundary ring into a plurality of segments defined by the equation; $N_T = 4\ (2I\text{-}1)$, where N_T = the number of segments, I = any integer greater than one (1);

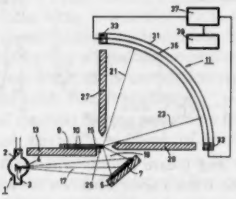
enclosing said segmented annular boundary ring with a plurality of collector electrodes placed adjacent to one another; and

electrically connecting alternate segments to said adjacent collector electrodes.

4,131,794
FLUORESCENT X-RAY SPECTROMETER

Edward Bruninx, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 22, 1976, Ser. No. 743,648
Claims priority, application Netherlands, Nov. 25, 1975, 7513716
Int. Cl.[2] G01N 23/20
U.S. Cl. 250—272 7 Claims

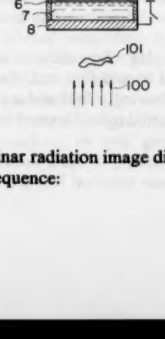


1. A fluorescent X-ray spectrometer for analyzing a specimen, comprising an X-ray source, a radiation detector and an analyzing crystal which comprises side faces and end faces, said analyzing crystal being arranged so that wavelength dispersion occurs and X-radiation of a given wavelength coincides at least substantially with a line transversely to the dispersion direction of the detector, said radiation detector being rigidly arranged in the spectrometer and being readable in a location-dependent and on-line manner, said X-ray source being located so as to direct X-rays to said specimen to produce fluorescent radiation and said analyzing crystal being located so that at least a said end face is exposed to and diffracts said fluorescent radiation, said radiation detector receiving said radiation from said analyzing crystal.

4,131,795
INSTANT RADIATION IMAGE DISPLAY ELEMENT

Mutsuo Takenouchi, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Mar. 11, 1977, Ser. No. 776,809
Claims priority, application Japan, Mar. 13, 1976, 51-27303
Int. Cl.[2] G03G 13/00; H01J 31/49
U.S. Cl. 250—315 A 8 Claims



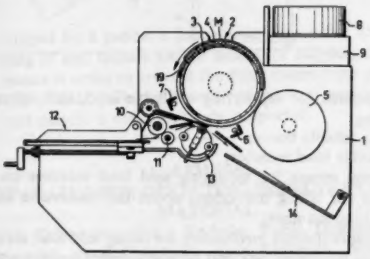
1. A generally laminar radiation image display element comprising, in ordered sequence:

(a) an optically transparent, electrically conductive base plate,
(b) a deformable elastomer layer,
(c) a flexible, electrically insulating, optically reflecting layer,
(d) a radiation absorptive, ionizable liquid layer, and
(e) a radiation permeable, electrically conductive plate.

4,131,796
APPARATUS FOR THERMOGRAPHIC DUPLICATION OF INFORMATION

Sven B. Kvarnegärd, Enebyberg, Sweden, assignor to AB Carl Lamm, Stockholm, Sweden

Filed Sep. 8, 1976, Ser. No. 721,235
Int. Cl.² G03C *5/16*
U.S. Cl. 250—319 **11 Claims**



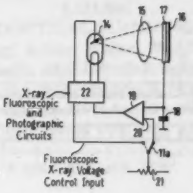
1. An apparatus for copying information from an original or master (M) provided with information comprising a rotatable drum, to which the master (M) with applied information is attached, and the master (M) during the rotation of the drum is exposed to directed heat radiation from one or more heat radiation sources outside said drum spaced from said master and is supplied with a dye carrier, the dye of which thereby adheres to the master (M) in accordance with the information applied thereon, whereafter unprepared copy receiving sheets are brought into contact with the master (M) and thereafter removed therefrom, characterized in that the drum comprised two portions separated and movable relative to each other, of which the first portion is a cooled cylinder, and the second portion is a segment of a cylindric shell concentric with said cylinder and closely abutting but movable about the surface of the cylinder, means for attachment of said master (M) to said segment and wherein said segment of a cylindric shell is only a part of a cylinder and does not extend about the entire circumference of the cylinder whereby said cylinder is directly subjected to said directed heat radiation during a portion of a complete revolution of the said segment.

4,131,797
X-RAY DIAGNOSTIC INSTALLATION FOR FLUOROSCOPY AND PHOTOGRAPHY

Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 1, 1977, Ser. No. 856,318
Claims priority, application Fed. Rep. of Germany, Dec. 10, 1976, 2656047
Int. Cl.² H05G *1/58*
U.S. Cl. 250—322 **1 Claim**

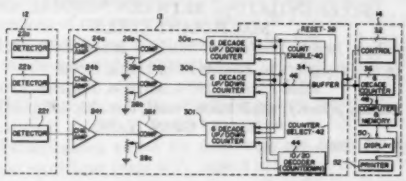
1. An x-ray diagnostic installation for fluoroscopy and photography, comprising
a fluoroscopic voltage adjustment means for adjusting fluoroscopic x-ray voltage,
radiation measuring means for sensing the dose rate during photography,
an automatic exposure timer for determining photographic time, connected with the radiation measuring means, and operable for switching off the x-ray energy upon attaining a predetermined dose, and
a switch for switching over from fluoroscopy to photography, characterized in that a common adjustable set point slement is connected with the fluoroscopic voltage adjusting means for controlling the fluoroscopic voltage while the switch is conditioned for fluoroscopy, and is connectable to the automatic exposure timer for adjustment of the switch-off dose during transition to photography in response to actuation of said switch to switch over to photography.



4,131,798
ARRAY GAMMA COUNTER

Reddy R. V. Reddy, Deerfield, and Michael E. Jolley, Round Lake, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 5, 1977, Ser. No. 784,900
Int. Cl.² G01T *1/00*
U.S. Cl. 250—328 **10 Claims**

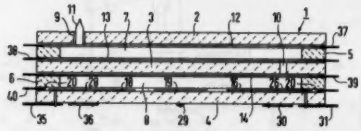


1. Apparatus for detecting and counting radioactive particles eminating for discrete samples in a plurality thereof comprising:
a plurality of detectors each immediately adjacent a respective discrete sample directly converting the respective number of radioactive particles eminating from a discrete sample to a corresponding electrical signal;
a plurality of counters each coupled to a respective detector for simultaneously providing a sample count in each counter responsive to the respective electrical signal;
control means coupled to each of said counters for enabling the accumulation of said sample count in each counter during repetitive, predetermined counting time intervals, said control means including count enable means and count disable means,
said count enable means providing an enable signal to each of said counters for initiating said respective sample count and said disable means thereafter providing a disable signal at the end of each of said repetitive, predetermined counting time intervals to each of said counters for stopping the respective sample count; and
read-out means responsive to said control means for periodically, sequentially reading out the accumulated sample count in each of said counters at the end of each of said predetermined counting time intervals.

4,131,799
IONIZATION CHAMBER

Volker A. W. Stieber, Lafayette, Calif., assignor to Applied Radiation Corporation, Walnut Creek, Calif.

Filed Apr. 1, 1977, Ser. No. 783,630
Int. Cl.[2] H01J *39/285*
U.S. Cl. 250—385 21 Claims



1. An ionization chamber for use with particle accelerators, comprising:

a) two measuring chambers formed by three mutually parallel walls which are spaced by spacer rings;

b) two of the three walls each having a single electrode mounted thereto;

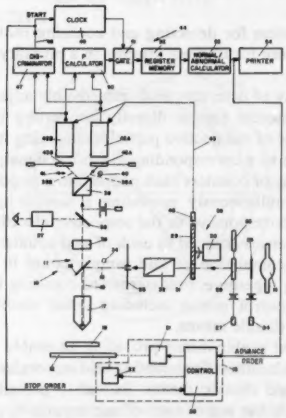
c) a third one of said three walls which forms an outer wall for one of said two measuring chambers having means for measuring substantially all inhomogeneities of a radiation intensity distribution pattern of a cone of rays, said means including a plurality of mutually insulated electrodes applied on a side of the third wall within the measuring chamber; and

d) the mutually insulated electrodes being connected to outer contact lugs.

4,131,800
METHOD OF AND APPARATUS FOR DIFFERENTIATING BETWEEN NORMAL AND MALIGNANT CELLS

Abraham Bruck, Haifa, and Michael Inbar, Rehovot, both of Israel, assignors to Elscint Ltd., Haifa, Israel

Filed Mar. 3, 1977, Ser. No. 774,215
Claims priority, application Israel, Jun. 13, 1976, 48776
Int. Cl.[2] G01N *21/38*
U.S. Cl. 250—461 B 17 Claims

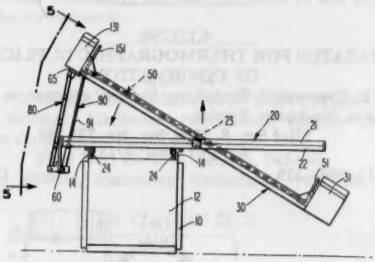


1. A method for determining the normality of a biological cell that has been labeled with a lipid soluble fluorescent dye and excited with polarized light by utilizing the stability of the state of polarization of fluorescence emitted by the cell as a function of excitation time.

4,131,801
X-RAY CRADLE TOP WITH TILTING MECHANISM

William F. Hogan, Woodbury, N.J., assignor to Spectrum X-Ray Corporation, Westville, N.J.

Filed Sep. 1, 1977, Ser. No. 829,665
Int. Cl.[2] A47F *5/12*; F16F *15/00*
U.S. Cl. 250—439 R 4 Claims



1. Apparatus for supporting a tiltable load, said apparatus comprising;

a. a non-tiltable frame;

b. a tiltable load member;

c. pivotal means for mounting said load member on said frame for tilting movement about the transverse axis of said load member;

d. a scissors-linkage mechanism for tilting said load member;

e. means mounting one end of said scissors-linkage mechanism at one end of said non-tiltable frame;

f. means connecting the other end of said scissors-linkage mechanism to one end of said tiltable load member;

g. drive means for extending and retracting said scissors-linkage mechanism to raise and lower said one end of said load member; and

h. damping means for preventing oscillation of said load member during extension and retraction of the scissor-linkage mechanism, said damping means comprising;

h-1 an elongated threaded rod;

h-2 means pivotally connecting the upper end of said threaded rod to said one end of said tiltable load member;

h-3 ball nut means on a lower portion of said threaded rod;

h-4 bearing means mounting said ball nut means at said one end of said non-tiltable frame, wherein when said scissors-like mechanism is moved toward its extended position, said rod is pulled toward an extended position causing said ball nut means to rotate on said rod, and wherein when said scissor-like mechanism is moved toward its retracted position, said rod is pulled downwardly, causing said ball nut means to rotate in the opposite direction on said rod.

4,131,802
AUTOMATIC PATIENT TABLE HAVING MEANS FOR TRANSPORTING PATIENT ALONG A TABLE

Arthur B. Braden, Mentor; Thomas R. McBride, Chardon; Donald J. Styblo, Northfield Center; Samuel K. Taylor, Chardon, and Joseph B. Richey, Shaker Heights, all of Ohio, assignors to Ohio-Nuclear, Inc., Solon, Ohio

Continuation of Ser. No. 700,539, Jun. 28, 1976, abandoned.
This application Jun. 22, 1977, Ser. No. 808,821
Int. Cl.[2] A61B *6/02*; G01N *23/08*; G03B *41/16*
U.S. Cl. 250—445 T 18 Claims

1. A patient support system for locating a desired part of the body in a predetermined planar area with minimal intersection of said area by said support system, comprising:

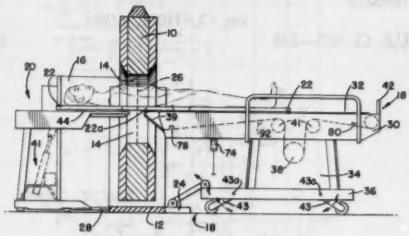
movable front and rear tables;

means for aligning said tables on either side of said planar area at a predetermined spacing;

a patient pallet resting on the top of at least said front table;

drive means located on said front table for propelling said patient pallet in either axial direction along the top of said tables; and

failsafe bar switch means located at the end of at least one of said tables away from said planar area and positioned to be



tripped by a patient's feet, means responsive to the tripping of said failsafe switch means for stopping said drive means in order to prevent the drive means from propelling said patient pallet with said patient to a position where said patient is not adequately supported.

4,131,803

APPARATUS FOR DETECTING DEFECTS IN SHEET MATERIAL

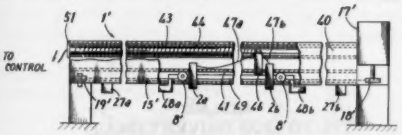
Shigeru Takematsu; Tohji Yoshida; Yukio Ikushima; Kunio Takeuchi, all of Takatsuki; Arao Kakinaka, Nishinomiya; Koichi Matsunaga, Neyagawa; Mamoru Shimakura, Takatsuki, and Yoji Komura, Takatsuki, all of Japan, assignors to Toyo Boseki Kabushiki Kaisha and Kasuga Denki Co., Ltd., both of, Japan

Filed Nov. 2, 1976, Ser. No. 738,151

Claims priority, application Japan, Nov. 5, 1975, 50/133423; Jul. 24, 1976, 51/99148; Jul. 24, 1976, 51/99149

Int. Cl.[2] G01N *21/32*

U.S. Cl. 250—563 **8 Claims**



1. An apparatus for detecting a defect in a sheet like material, comprising;

means provided opposite to the surface of said sheet like material for detecting a defect on said sheet like material,

means for causing relative movement of said defect detecting means with respect to said sheet like material in a given direction of said sheet like material for scanning said sheet like material by said defect detecting means throughout a first relatively large distance in said given direction,

means responsive to a defect detected output from said defect detecting means for controlling said relative movement causing means for scanning said screen like material by said defect detecting means throughout a second relatively small distance in said given direction including the detected defect,

said relative movement causing means comprises guide means provided in said given direction of said sheet like material for slidably supporting said defect detecting means for movement in said given direction of said sheet like material,

means for driving said defect detecting means along said guide means,

said relative movement causing means comprises a flexible electric wire provided in said guide means for electrical connection to said defect detecting means,

wire cover means in said guide means for covering said flexible electric wire, and

said electric wire comprises a flexible spiral coil wire.

4,131,804

ELECTROOPTICAL SCANNING DEVICE

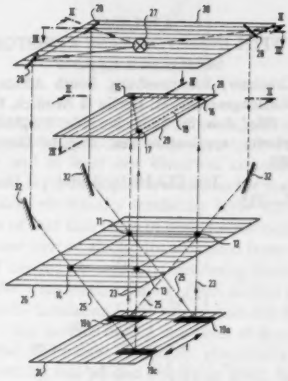
Erwin Sick, Icking; Arthur Walter, Waldkirch, and Günter Fetzer, Gundelfingen, all of Germany, assignors to Erwin Sick Gesellschaft m.b.H. Optik-Elektronik, Waldkirch, Germany

Filed Jun. 16, 1977, Ser. No. 807,085

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1976, 2630209

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—566 **12 Claims**



1. An electrooptical scanning device for detecting the relative locations of register marks arranged on a moving web one behind the other along a first track only, the first track extending in the direction of movement of the web, and also of register marks arranged in side-by-side, neighboring first and second, tracks extending in the direction of web movement, the electrooptical scanning device comprising: a light source; optical illuminating means for directing light from the light source at an oblique angle with respect to the web onto at least three positions along the first and second tracks for illuminating such positions; a photo-electric detector for each of said positions arranged for receiving light from the source and scattered generally perpendicularly from the associated illuminated positions, the detectors generating output signals which are responsive to the scattered light received by them; whereby the passage of a register mark past one of the positions and its relative location with respect thereto can be detected by analyzing the output signals.

4,131,805

LINE POWER CORD ADAPTOR

James Austin, Shrewsbury, and Daniel Clemson, Weston, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Aug. 26, 1977, Ser. No. 827,920

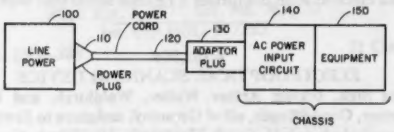
Int. Cl.[2] H01R *13/50*

U.S. Cl. 307—147 **9 Claims**

1. In an improved electrical equipment system energized by AC line power having a magnitude selected from at least three predetermined magnitudes, said power being received at a first end of a power cord by way of a power plug attached thereto and flowing therethrough to a second end of said cord, said cord containing no more than three mutually insulated conductors, said system including an AC power input circuit and

electrical equipment powered by output from said circuit, the improvement comprising:

adaptor plug means connected between said second end of



said power cord and input of said circuit for adapting said circuit to operate with said selected magnitude of line power without requiring any physical changes within said circuit.

4,131,806

I.I.L. WITH INJECTOR BASE RESISTOR AND SCHOTTKY CLAMP

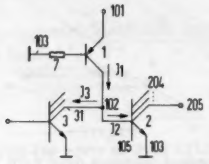
Nikolaus Kirschner, Johannesburg, South Africa, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 28, 1976, Ser. No. 700,534

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1975, 2530288

Int. Cl.² H01L *27/04*

U.S. Cl. 307—215 **3 Claims**



1. An inverter comprising a lateral bipolar transistor and a vertical bipolar transistor, said vertical transistor having at least one collector, the collector of said lateral transistor being connected to the base of said vertical transistor, the emitter of said vertical transistor being connected to one terminal of a supply voltage source, the emitter of said lateral transistor being connected to the other terminal of said supply voltage source, and a resistor connecting said one terminal of the supply voltage source to the base of said lateral transistor, in which a first doped layer of a first conductivity type is deposited epitaxially upon a doped substrate of the opposite conductivity type, said emitter and said collector of said lateral transistor being first and second diffused regions in the upper surface of said epitaxial layer which provide, respectively, the emitter and collector of said lateral transistor and which are separated from one another by a portion of said epitaxial layer which provides the base of said lateral transistor, first and second doped regions being provided in the upper surface of said second diffused region, said two doped regions being the collectors of said vertical transistor, a highly doped buried layer of the first conductivity type being provided in said epitaxial layer below said vertical transistor with the exception of part of said vertical transistor being adjacent to the base of said lateral transistor which, by means of a doped terminal region provides a conductive path to said emitter region of said vertical transistor from said one terminal of said supply voltage source, said buried layer and said terminal region also providing a conductive path to said base region of said lateral transistor from said one terminal of said supply voltage source through a portion of said epitaxial layer which provides a resistance element inserted serially between said base region of said lateral transistor and said one terminal of said supply voltage source.

4,131,807

SAWTOOTH GENERATOR

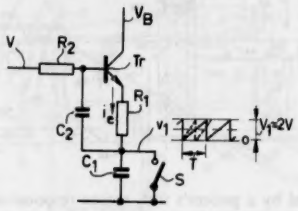
Jan A. C. Korver, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1977, Ser. No. 797,674

Claims priority, application Netherlands, May 20, 1976, 7605373

Int. Cl.² H03K *4/56*

U.S. Cl. 307—228 **13 Claims**



1. A circuit for generating a sawtooth voltage across a first capacitor which is periodically charged by a charging current from a power supply source, said circuit comprising an amplifying element having an input electrode and a first and a second output electrode, a resistor having a first end coupled to the first output electrode of the amplifying element and a second end coupled to a first end of the first capacitor, the other end of said capacitor being coupled to a first terminal of the power supply source, the second output electrode of the amplifying element being coupled to the second terminal of the power supply source, a second capacitor coupled between the input electrode of the amplifying element and the junction of the first capacitor and the resistor, a switch means coupled in parallel with the first capacitor for periodically discharging said first capacitor, a direct current voltage source coupled to said input electrode and having an internal resistance, and a network comprising the second capacitor and said internal resistance and having a time constant which is large relative to the charging time of the first capacitor.

4,131,808

TTL TO MOS DRIVER CIRCUIT

James R. Kuo, Cupertino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Aug. 4, 1977, Ser. No. 821,673

Int. Cl.² H03K *17/00*

U.S. Cl. 307—270 **9 Claims**

1. A TTL to MOS driver circuit comprising:

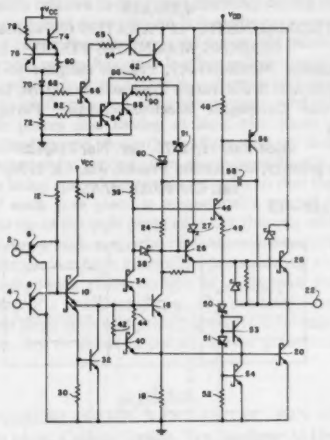
input circuitry including an input buffer transistor coupled between a TTL power source and ground reference for generating buffer output signals in response to applied binary input signals;

a phase splitter transistor coupled between a MOS power source and ground and to the emitter of said input buffer transistor, said phase splitter transistor being switched between conductive and nonconductive states in response to said buffer transistor output signals;

an output stage including first and second output transistors in series between said MOS power source and ground and coupled to said phase splitter transistor, said first output transistor being enabled when said phase splitter transistor is conductive, said second output transistor being enabled when said phase splitter transistor is nonconductive, the interconnection of said first and second output transistors providing the output terminal of said driver; and

current control circuitry responsive to a predetermined drop

in voltage of said TTL power source for switching off all MOS power in the conductor to said phase splitter transis-



tor and to said output stage, and for instantaneously grounding stored charges in said conductor.

4,131,809

SYMMETRICAL ARRANGEMENT FOR FORMING A VARIABLE ALTERNATING-CURRENT RESISTANCE

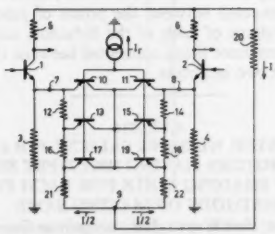
Nicolaas J. Baars, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 586,052, Jun. 11, 1975. This application Oct. 31, 1977, Ser. No. 847,221

Claims priority, application Netherlands, Jun. 17, 1974, 7408034

Int. Cl.² H03K *1/14*

U.S. Cl. 307—303 **11 Claims**



4. A symmetrical circuit arrangement device for forming a variable alternating-current resistance between a first and a second terminal, comprising:

(a) a semiconductor body including first and second regions of opposite conductivity types and forming an elongated p,n junction therebetween to provide a diode;

(b) said first and second terminals disposed at said first region of said semiconductor body;

(c) a third terminal being located on said first region along said p,n junction and substantially midway between said first and second terminals;

(d) a bias current source and means for conducting the current of said bias current source through said third terminal to said first region; and

(e) a control current source connected to said second region, the controllable current of said control current source having a polarity to pass the pn-junction between said first and second regions.

4,131,810

OPTO-ELECTRONIC SENSOR

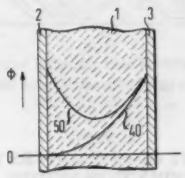
Karl Knauer, Gauting, and Hans-Joerg Pfleiderer, Zorneding, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 10, 1976, Ser. No. 694,836

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1975, 2527657

Int. Cl.² H03K *3/42*; G11C *19/28*; H01L *29/78, 27/14*

U.S. Cl. 307—311 **6 Claims**



1. An opto-electronic sensor comprising: a thin layer of doped semiconductor material having a front surface and a rear surface and at least one electrical connection contact carried by said layer of doped semiconductor material; a first light-permeable, electrically insulating layer carried on said front surface of said thin layer of doped semiconductor material; at least one row of electrodes separated from one another by gaps and carried on said first insulating layer to form a charge-coupled transmission device; a thin second light-permeable, electrically insulating layer of constant thickness covering the entire rear surface of said thin layer of doped semiconductor material; and a light-permeable, electrically conductive electrode covering said second insulating layer; light incident on said thin layer which produces minority charge carriers; a potential applied to said thin layer and to at least a first electrode of said row of electrodes; a potential of one polarity applied to said electrically conductive electrode such that a depletion zone extends from said rear surface beneath said electrically conductive electrode to said front surface beneath said first electrode; a potential of said one polarity applied to at least a second electrode of said row of electrodes such that a potential well is formed in a depletion zone at said front surface beneath said second electrode in which said minority charge carriers are accumulated, the depletion zone beneath said second electrode extending to the depletion zone beneath said electrically conductive electrode.

4,131,811

TRACTION MEANS WITH ELECTRODYNAMIC VEHICLE SUSPENSION FOR HIGH-SPEED LAND TRANSPORT

Voldemar V. Apsit; Zigurd K. Sika, and Ivan I. Kurkalov, all of Riga, U.S.S.R., assignors to Fiziko-Energeticheskiy Institut Akademii Nauk Latviiskoi SSR, Riga, U.S.S.R.

Filed Jun. 28, 1977, Ser. No. 810,883

Claims priority, application U.S.S.R., Jul. 12, 1976, 2384764

Int. Cl.² H02K *41/02*

U.S. Cl. 310—12 **2 Claims**

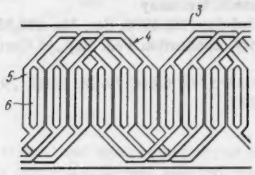
1. A traction means with electrodynamic suspension of a vehicle for high-speed land transport, comprising:

a synchronous linear motor;

an exciting winding of said synchronous linear motor, mounted on said vehicle and also serving as the exciting winding for electrodynamic suspension of said vehicle;

a three-phase armature winding of said synchronous linear motor, horizontally extending along the track, said armature winding being a single-layer winding with one turn for the pole and phase, its conductors in the active area being made as strips extending in parallel with the plane of

the track and having a width of up to one third of the pole pitch, said exciting winding inducing eddy currents in said



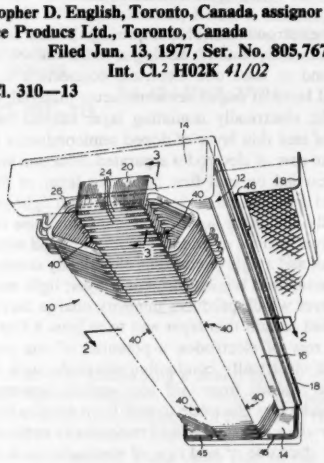
strips on the side of said vehicle, which eddy currents ensure electrodynamic suspension of said vehicle.

4,131,812

ATTACHMENT OF SIDE COVERS TO LINEAR INDUCTION MOTOR

Christopher D. English, Toronto, Canada, assignor to Spar Aerospace Producs Ltd., Toronto, Canada

Filed Jun. 13, 1977, Ser. No. 805,767
Int. Cl.² H02K *41/02*
U.S. Cl. 310—13 **2 Claims**



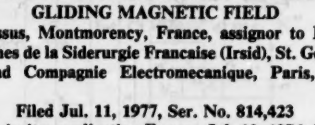
1. In a primary member of a single-sided linear induction motor having, a frame, a core member having a plurality of coil assemblies mounted in the coil slots thereof and secured therein by means of a plurality of wedge members, each of the wedge members having an upper face directed towards a coil assembly and a lower face disposed below the core member, the coil assemblies having nose portions projecting laterally from opposite sides of the core member, a pair of side covers adapted to extend over the nose portions of the coils, each side cover member having inner and outer longitudinally extending side edges, the outer side edge of each side cover member being secured to the frame outwardly from the coil noses on opposite sides of the core a substantial distance above the lower face of the wedge members, the improvement of; a plurality of cover mounting brackets located at longitudinally spaced intervals along the length of said core, each of said cover mounting brackets comprising a main body portion and a head portion at one end of the main body portion, the head portion projecting laterally from the main body portion, the other end of the main body portion being located within a coil slot of the core and secured therein between a wedge member and a coil assembly with the head portion thereof disposed above the lower face of the wedge member and spaced below the lower face of its associated coil, the inner edges of each of said side covers being downwardly curved and notched at longitudinally spaced intervals corresponding to the longitudinal spacing of the mounting brackets so as to extend inwardly and downwardly over the laterally extending head portions of the mounting brackets on opposite sides of the main body portions to be supported by the head portion in a plane above the plane of the lower face of the wedge members.

4,131,813

ELECTROMAGNETIC APPARATUS GENERATING A GLIDING MAGNETIC FIELD

Jean Delassus, Montmorency, France, assignor to Institut de Recherches de la Siderurgie Francaise (Irsid), St. Germain-en-Laye and Compagnie Electromecanique, Paris, both of, France

Filed Jul. 11, 1977, Ser. No. 814,423
Claims priority, application France, Jul. 12, 1976, 7621372
Int. Cl.² H02K *41/02*
U.S. Cl. 310—13 **3 Claims**



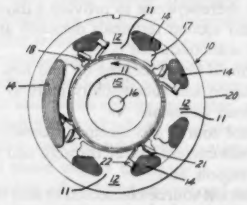
1. An electromagnetic apparatus comprising two inductors adapted to generate a gliding magnetic field, each of the inductors having a respective plane active face, the plane faces of the inductors defining therebetween a substantially parallelepiped space, for receiving an electrically conductive body to constitute an armature between the inductors, a plurality of pairs of recti-linear electrical conductors including an input conductor and an output conductor at each of the active faces of the inductors, the pairs of conductors being associated to form two-phase imbricated windings and connected in series at the middle of each of the inductors, the input conductor of each of the inductors being connected to the output conductor of the other inductor to form a single closed winding connected as a Wheatstone bridge, and a two-phase generator feeding electric energy to the input conductors, one of the phases of the generator being connected between the points of junction of the two-phase windings of each of the inductors and the other phase of the generator being connected between the points of junction of the two inductors.

4,131,814

CONCENTRATED WINDING SALIENT-POLE SHADED POLE MOTORS HAVING MULTIPLE SHORT CIRCUITED SHADING COILS FOR EACH POLE AND METHODS OF MAKING SAME

Joe T. Donahoo, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 293,802, Oct. 2, 1972, Pat. No. 3,959,678. This application May 20, 1976, Ser. No. 688,251
Int. Cl.² H02K *17/00*
U.S. Cl. 310—172 **10 Claims**



1. A shaded pole motor comprising a stator assembly having

at least one excitable winding, a rotor assembly including a short circuited squirrel cage winding, and means for supporting the rotor assembly in spaced apart air gap defining relation with the stator assembly and for permitting rotation of the rotor assembly relative to the stator assembly during excitation of said winding; said stator assembly including a magnetizeable core having circumferentially spaced apart pole pieces; at least one of the pole pieces having a leading pole tip configured to establish a relatively high magnetic reluctance therealong, as compared to another region of such pole piece; said at least one of the pole peices also having at least two short circuited shading coils disposed along the trailing pole tip thereof at a first large span and a second short span, respectively; and said pole pieces being spaced apart magnetically so that the leading pole tip of each pole piece is magnetically spaced from the trailing pole tip of the pole piece adjacent thereto; said leading pole tip having a high magnetic reluctance characteristic on a stepped construction basis generally corresponding to the high magnetic reluctance characteristic of a stepped pole piece having a step of a preselected span in a predetermined range, and said first large span comprising a span in the range of from about 50 percent to about 82 percent of the preselected span.

4,131,815

SOLID PIEZOELECTRIC SAND DETECTION PROBES

Paul A. Boatright, College Station, Tex., assignor to Oceanography International Corporation, College Station, Tex.

Filed Feb. 23, 1977, Ser. No. 771,102
Int. Cl.² H01L *41/10*
U.S. Cl. 310—323 **13 Claims**

1. An apparatus for detecting the presence of particulate matter in a fluid stream flowing through a conduit, said apparatus comprising:

an acoustical probe means for detecting the presence of particulate matter in a moving fluid stream, said probe means responsive to the presence of particulate matter in the fluid stream and relatively unresponsive to the movement of said fluid, said probe means having,

a solid probe adapted to be inserted into a conduit and to be in contact with said fluid stream;

an acoustical transducer disposed adjacent said probe in mechanical contact therewith, responsive to acoustical energy imparted by the collision of particulate matter with said probe, said transducer generating an electrical signal corresponding to the influx of acoustical energy from the collision of the particulate matter with said probe; and

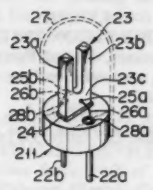
means for maintaining said transducer in constant mechanical contact with said probe for transmitting acoustical energy from said probe to said transducer.

4,131,816

MECHANISM AND METHOD FOR SUPPORTING A TUNING FORK-TYPE QUARTZ CRYSTAL ELEMENT

Hozumi Nakata, Iruma, Japan, assignor to Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 534,146, Dec. 18, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 729,179
Claims priority, application Japan, Dec. 22, 1973, 48-3032; Aug. 30, 1974, 49-103980
Int. Cl.² H01L *41/10*
U.S. Cl. 310—348 **15 Claims**



1. A tuning fork-type quartz crystal device, comprising:

a quartz crystal element comprising a pair of arms having substantially the same dimensions and a common connecting section connecting the corresponding ends of said paired arms, said common connecting section having no uncoupling recesses, or the like, therein;

holding means having a surface for receiving said quartz crystal element, means for substantially stationarily mounting said receiving surface and a pair of embedded external electrodes; and

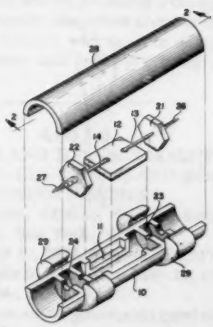
an adhesive interposed between said common connecting section of said quartz crystal element and said receiving surface of said holding means for firmly and substantially non-resiliently fixing in face-to-face relationship only the bottom surface of said common connecting section of said quartz crystal element to said holding means for supporting said crystal element, said adhesive agent being applied such that the side surfaces of said common connecting section are substantially free of restraining forces against vibration.

4,131,817

SPARK PLUG POWER ENHANCER

Nassir Najibi, 2827 W. Jerome St., Chicago, Ill. 60645

Filed Aug. 1, 1977, Ser. No. 820,422
Int. Cl.² H01T *13/46*
U.S. Cl. 313—124 **4 Claims**



1. A spark enhancer for internal combustion engines comprising:

a first electrode adapted to be electrically connected to the ignition coil of a spark ignition system;

a second electrode spaced from the first electrode and adapted to be electrically connected to the firing gap of a spark plug;

a spark modifying separation element in contact with both of said first and second electrodes and holding said electrodes in a spaced relationship, said element including provision for an air gap between said electrodes;

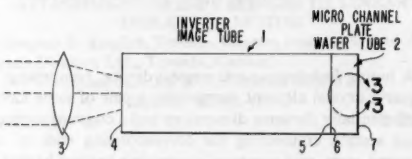
said spark modifying element being formed of a natural material comprising a marine shell.

4,131,818

NIGHT VISION SYSTEM

Marshall Wilder, deceased, late of Portola Valley, Calif. (by Virginia H. Wilder, executrix), assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Oct. 12, 1967, Ser. No. 675,279
Int. Cl.² H01J *39/14*
U.S. Cl. 313—95 **3 Claims**



1. A night vision system for image intensification having high luminous gain and high resolution with low noise deterioration comprising:

an inverter image tube having an input window, means coupled to said input window for converting light photons to free electrons, means for accelerating and focusing said electrons, means for converting said accelerated electrons into a new set of light photons, and an output window;

an electron multiplying image tube having an input window and an output window;

means coupling said input window of said electron multiplying image tube to said output window of said inverter image tube; and

optical means focusing an inverted image of available light onto said input window of said inverter image tube.

4,131,819

LEAD WIRES FOR INCANDESCENT LAMP

James A. Graves, Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 15, 1978, Ser. No. 879,323
Int. Cl.² H01J *5/50*
U.S. Cl. 313—331 **5 Claims**

1. In an electric lamp comprising a vitreous envelope, at least two lead wires extending into the interior of said envelope, and a light source connected to the inner ends of said lead wires, the improvement comprising:

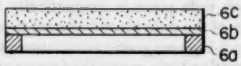
the inner portions of said lead wires being characterized by a stiffness of approximately 300–500 and said inner portions vibrating approximately in unison when said lamp is subjected to shock.

4,131,820

SECONDARY ELECTRON MULTIPLICATION TARGET

Hiroshi Washida, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 669,741, Mar. 24, 1976, abandoned.
This application Mar. 9, 1977, Ser. No. 775,939
Int. Cl.² H01J *31/00, 31/26, 31/48;* B32B *5/16*
U.S. Cl. 313—377 **5 Claims**



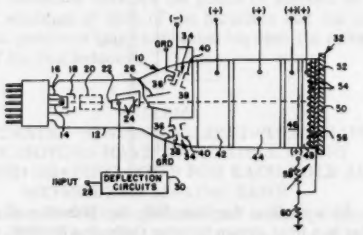
1. A secondary electron multiplication target for a secondary electron conducting type vidicon comprising an electrically conductive support layer and a secondary electron emitting layer provided on that side of said support layer which faces a cathode emitting scanning electrons, wherein said secondary electron emitting layer is a porous layer consisting of an agglomeration of primary particles of at least one compound selected from the group consisting of CaF_2, MgF_2, and SrF_2; said porous layer being formed by evaporating said compound from an evaporating source and said primary particles being those unagglomerated particles which are just emitted from said evaporating source and each have an average particle size ranging from scores of angstroms to 100 angstroms.

4,131,821

AGING RESISTANT MIXTURES IN BISTABLE STORAGE TUBES

Ralph A. Mossman, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Sep. 6, 1977, Ser. No. 831,019
Int. Cl.² H01J *29/39*
U.S. Cl. 313—398 **17 Claims**



1. A storage target for storing an electron image, comprising:

a nonconducting support member of electrical insulative material;

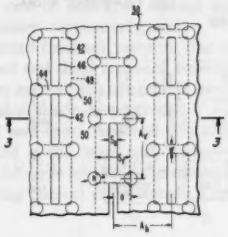
collector electrode means provided on one surface of said support member; and

a storage dielectric layer extending along said collector electrode means and containing a mixture including phosphor material having metal oxide material adhered at random locations over the surface of said phosphor material and rare earth material selected from the group consisting of a rare earth oxide, a rare earth oxysulfide and a rare earth activated rare earth oxide or oxysulfide, said metal oxide material being about nine percent by weight of said phosphor material.

4,131,822
CATHODE RAY TUBE WITH STRESS-RELIEVED SLOT-APERTURE SHADOW MASK

Tom W. Branton, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed May 20, 1977, Ser. No. 799,078
Int. Cl.[2] H01J *29/07*
U.S. Cl. 313—403 4 Claims

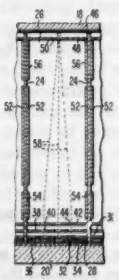


1. A shadow mask color cathode ray tube including an apertured electrode comprising a formed metal sheet having
(a) an array of elongated apertures therein, each of said apertures having a relatively small generally rectangular surface opening in one side of said sheet and a relatively large generally rectangular surface opening in the other side of said sheet, said apertures being disposed in a plurality of substantially parallel rows with the apertures being elongated in the direction of said rows and being spaced apart by webs, and
(b) an array of surface cavities disposed in said one side of said sheet, each of said cavities being laterally spaced from the center line of a given row of apertures and adjacent to and substantially opposite a web in said given row; each of said cavities partially overlying the relatively large surface openings in said other side of said sheet of the two apertures which are in the same row and adjacent to the web disposed opposite said cavity, to form a thinned region of said mask at the outer region of said web and the corners of said adjacent apertures.

4,131,823
MODULAR FLAT DISPLAY DEVICE WITH BEAM CONVERGENCE

Thomas L. Credelle, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 3, 1977, Ser. No. 838,658
Int. Cl.[2] H01J *29/72*
U.S. Cl. 313—422 8 Claims

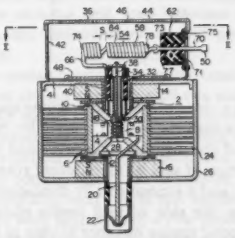


1. In a display device which comprises an evacuated envelope having substantially flat, parallel spaced front and back walls and spaced, substantially parallel support walls extending between and substantially perpendicular to said front and back walls, said support walls dividing said envelope into a plurality of channels, means at one end of each of said channels for generating electrons and directing the electrons as beams into said channels with three beams being directed into each channel, beam guides along each of said channels for confining the electrons in the beam as the beams travel longitudinally along the channel and for selectively deflecting the beams toward a phosphor screen on the front wall of the envelope at selected points along the channels, and means in each channel between the beam guides and the phosphor screen for deflecting the beams transversely across the channel so that the beams scan the phosphor screen, the improvement comprising
means in each channel for forming an electrostatic field transversely across the channel which acts as an electron lens for converging the three beams at a point adjacent to but spaced from the phosphor screen.

4,131,824
FILTER DEVICE FOR HIGH FREQUENCY GENERATING DEVICE

Kaichiro Nakai, and Hisao Saito, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 17, 1977, Ser. No. 778,745
Claims priority, application Japan, Sep. 20, 1976, 51-111809
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.51 12 Claims



1. A high frequency generating device comprising:
a high frequency generating source;
a shield box mounted to said high frequency generating source in which undesirable high frequency energy generated from said high frequency generating source is confined;
power supply conductors connected electrically to said high frequency generating device and extending to the exterior through the inside of said shield box; and
a choke element which is connected to said power supply conductor with in said shield box for damping said undesirable high frequency energy generated in said high frequency generating source, including a core type inductor with a high frequency absorptive member as its core and a coreless type inductor with no core of high frequency absorptive member, said inductors being connected in series.

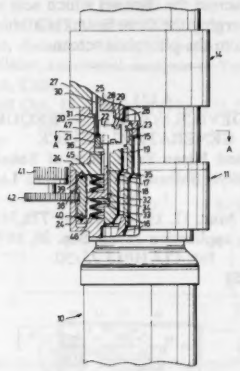
4,131,825
DITHERABLE AND TUNABLE MAGNETRON COMPRISING AXIALLY TUNING AND ROTATIONAL TUNING MEMBERS

Lennart P. J. Mattsson, Järfälla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 19, 1977, Ser. No. 798,317
Claims priority, application Sweden, May 21, 1976, 7605765
Int. Cl.[2] H01J *25/50*
U.S. Cl. 315—39.61 9 Claims

1. A tunable magnetron comprising a cathode, an anode including an annular member disposed about and spaced from said cathode and a plurality of anode plates spaced about the inner wall of said annular member and extending radially therefrom toward said cathode, each pair of adjacent anode

plates defining a resonant cavity therebetween, the inner ends of said anode plates adjacent said cathode being spaced from and defining with said cathode an interaction spaced therebetween, said anode plates each defining an axial slot, the slots defined by said anode plates forming an annular groove extending about the axis of said annular member, means for producing an axial magnetic field in said interaction space, a first tuning member rotatable about an axis generally parallel to the axis of said annular member and having an end portion extending into said groove, said end portion of said first tuning



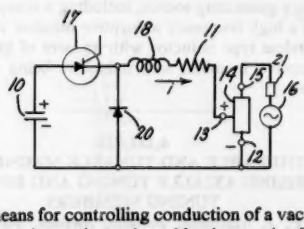
member having a circumferentially varying quantity of electrically conductive material so that a periodic rapid variation in the frequency of the magnetron is produced upon movement of said end portion in said groove during rotation of said first tuning member, and a second axially displaceable tuning member disposed on the side of said anode plates opposite said groove, said second tuning member having at least one electrically conductive axial projection extending into at least one of said resonant cavities for varying the frequency of the magnetron upon axial displacement of said second tuning member.

4,131,826

TRIGGERING CIRCUIT FOR TRIGGERED VACUUM GAPS

Lawson P. Harris, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 3, 1977, Ser. No. 821,555
Int. Cl.² H02M *1/02*
U.S. Cl. 315—234 **5 Claims**



1. Circuit means for controlling conduction of a vacuum gap device having a trigger electrode and having a pair of primary gap electrodes energized by a power source, said circuit means energizing said trigger electrode at a predetermined, controllable time, and comprising:

capacitive energy storage means;

switching means coupled in series with said capacitive energy storage means;

unidirectional conducting means coupled in parallel with the series-coupled capacitive energy storage means and switching means; and

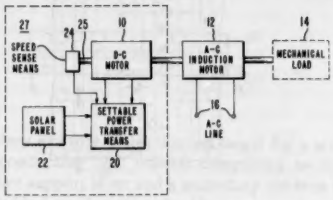
inductance means coupling said switching means to said trigger electrode.

4,131,827

POWER TRANSFER APPARATUS

Robert D. Larrabee, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1977, Ser. No. 821,801
Int. Cl.² H02P *7/80*
U.S. Cl. 318—46 **10 Claims**



1. The combination of:

a source of DC power which may vary;

connections for a source of AC power;

a DC motor having an armature and a field winding;

power transfer means coupling said source to said motor for supplying current to the armature of said motor and for also supplying a voltage across the field winding of said motor, said power transfer means including means for adjusting the value of voltage;

an AC motor-generator connected to said connections for said source of AC power for receiving operating power therefrom, said motor-generator being mechanically coupled to said DC motor and being driven thereby; and

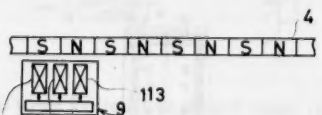
means responsive to a parameter indicative of the power supplied to said DC motor for controlling said means for adjusting in a sense to maximize said parameter.

4,131,828

APPARATUS FOR ROTATIVELY DRIVING A TURN TABLE

Teruo Houshi, Oota, Japan, assignor to Sanyo Electric Co., Ltd., Moriguchi and Toyko Sanyo Electric Co., Ltd., Oora, Gunma, both of, Japan

Filed Dec. 9, 1977, Ser. No. 859,264
Claims priority, application Japan, Dec. 14, 1976, 51-153883; Dec. 14, 1976, 51-153884; Jan. 31, 1977, 52-10420
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **10 Claims**



1. An apparatus for rotatively driving a turn table, comprising:

a motor having a rotor including an arrangement of a plurality of magnetic poles such that the north and south poles are alternately disposed in a circle on said turn table and a stator provided opposite to said arrangement of the magnetic poles and including first, second and third stator pole means for electromagnetically driving said motor,

means for generating three alternating current drive signals having a phase difference of substantially 120° from each other,

means responsive to said drive signal generating means for amplifying said three alternating current drive signals for supplying the three amplified alternating current drive signals to said three stator pole means of said stator of said motor,

said amplifying means comprising first, second and third amplifiers for amplifying said three alternating current drive signals, respectively, for supplying the amplified three alternating current drive signals to one end of the corresponding one of said first, second and third pole means of said stator, respectively, and

first, second and third feedback resistors, one end of each of said first, second and third feedback resistors being coupled to the other end of each of said first, second and third pole means of said stator, respectively,

said first, second and third feedback resistors being commonly connected at the other end, whereby at least the component of the same level and the same phase included in said alternating current drive signals is removed.

4,131,829

ELECTRIC POWER CONVERTING APPARATUS FOR USE IN BATTERY CARS

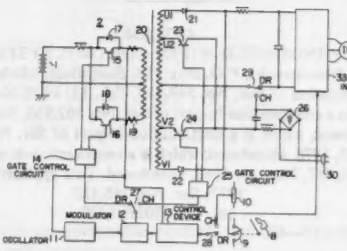
Choichi Gocho, Tokyo, Japan, assignor to Tokyo Shibaura Denki K.K., Japan

Filed Oct. 18, 1976, Ser. No. 733,308

Claims priority, application Japan, Oct. 13, 1975, 50-122563; Oct. 13, 1975, 50-122564; Oct. 23, 1975, 50-127823

Int. Cl.² H02P *1/00*

U.S. Cl. 318—139 **7 Claims**



1. In an electric power converting apparatus for use in a battery car of the type comprising a storage battery, a first inverter including first switching elements for converting the DC voltage of said storage battery into an AC voltage, a step up transformer including primary and secondary windings for stepping up the output AC voltage of said first inverter, a first rectifier for rectifying the secondary voltage of said step up transformer, a second rectifier for rectifying the alternating voltage of an external source of commercial supply, a third inverter including second switching elements connected between the secondary winding of said step up transformer and the output of said second rectifier for converting the output of said second rectifier into an AC voltage for energizing the secondary winding of said step up transformer, and a switching circuit for switching the operations of said first and second inverters, the improvement which comprises rectifier diodes respectively connected directly in parallel opposition with said first switching elements of said first inverter for charging said storage battery and wherein said third inverter is connected to the same secondary winding of said transformer as said first rectifier, said rectifier diodes being connected to the same primary winding of said transformer as said first inverter.

4,131,830

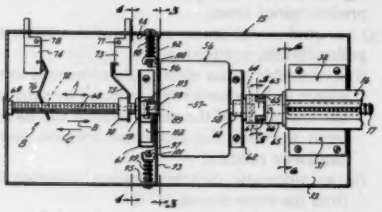
POSITION CONTROL AND OBSTRUCTION DETECTOR APPARATUS FOR A MOTOR-DRIVEN DOOR OPERATOR

Maw H. Lee, and Barry V. Prehodka, both of Cincinnati, Ohio, assignors to Clopay Corporation, Cincinnati, Ohio

Filed Feb. 8, 1978, Ser. No. 876,004

Int. Cl.² H02P *1/00, 3/00*

U.S. Cl. 318—266 **28 Claims**



1. In an operator for driving a load, said operator including a drive means connectable to said load for moving said load between a first position and a second position, a selectively energizable motor having a motor shaft coupled at one end to said drive means for actuating said drive means to move said load, and position control means for controlling energization of said motor for moving said load between said first and second positions, the improvement in said position control means comprising:

a control screw means rotatably mounted coaxially with said motor shaft at an end opposite said one end and directly rotated by said motor shaft when said motor is energized;

a travel nut threadedly engaged with said control screw means for reciprocably moving along said control screw means as said control screw means rotates;

means for constraining said travel nut against sympathetic rotary motion with said control screw means as said control screw means rotates while allowing reciprocal movement in a linear path therealong;

a first position detection means proximate said control screw means and actuable by said travel nut for de-energizing said motor when actuated by said travel nut as said operator drives said load to said first position; and

a second position detection means proximate said control screw means and actuable by said travel nut for de-energizing said motor when actuated by said travel nut as said operator drives said load to said second position.

4,131,831

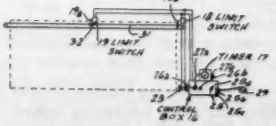
DRAPERY OPENING AND CLOSING SYSTEM

Michael S. Bochenek, 7714 S. Meade, Burbank, Ill. 60459, and Bradley X. Boyer, Chicago, Ill., assignors to Michael S. Bochenek, Burbank, Ill.

Filed Jun. 13, 1977, Ser. No. 805,639

Int. Cl.² H01H *43/20*

U.S. Cl. 318—282 **3 Claims**



1. A drapery opening and closing system for draw drapes movable over a traverse means between an open and closed position by use of a drape drive system, comprising:

(a) drape traverse means;

(b) a drape cord pully system connecting to the traverse

means and extending downwardly with respect to the traverse means;

(c) a first limit switch means positioned to be activated when said drapes are opened;

(d) a second limit switch means positioned to be activated when said drapes are substantially closed;

(e) a power source;

(f) a timer means connected to the power source for applying and disconnecting power from the power source at predetermined times;

(g) a control circuit means positioned at a lower end of the pulley system, comprising:

(i) a reversible motor electrically connected to the power source and mechanically connected by a drive pulley to the lower end of the pulley system and having power input terminals for clockwise rotation and counterclockwise rotation;

(ii) an automatic switching means activated by power from the timer means;

(iii) a manual switching means and said first and second limit switch means each forming a series circuit with the automatic switching means, said series circuit being connected between the power source and the clockwise and counterclockwise power input terminals of the reversible motor; and

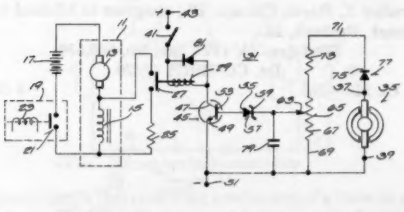
(h) said control circuit means automatically opening and closing the draw drapes at predetermined times as set by the timer means, said control circuit means turning off the system or opening and closing the drapes independent of of the times set on the timer means when the manual switching means is operated, and said control circuit means turning off the system automatically when said first and second limit switch means are activated when the drapes are respectively fully opened and substantially closed.

4,131,832

SPEED SENSITIVE FIELD WEAKENING CONTROL FOR TRACTION MOTORS

David T. Cavil, Menomonee Falls, Wis.; Gerald N. McAuliffe, Lincoln, Nebr., and Russell J. Van Rens, Waukesha, Wis., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 14, 1977, Ser. No. 787,426
Int. Cl.² H02P 7/00
U.S. Cl. 318—358 **41 Claims**



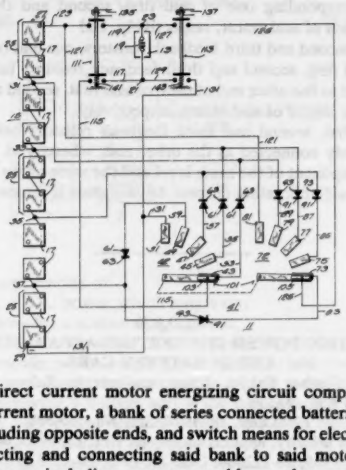
1. A control comprising a direct current motor including a field winding and a field weakening resistor, a field weakening solenoid switch connected to said field weakening resistor and including a solenoid coil, switch means connected to said coil for selectively connecting said coil to a source of direct current and thereby operate said solenoid switch to connect said field weakening resistor in parallel with said field winding, and means responsive solely to motor speed for operating said switch means.

4,131,833

ARRANGEMENT FOR TAPPING BATTERY BANK ALTERNATELY FROM OPPOSITE ENDS

Gerald N. McAuliffe, and Eldon W. Wooters, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 25, 1977, Ser. No. 790,534
Int. Cl.² H02M 1/08
U.S. Cl. 318—440 **28 Claims**



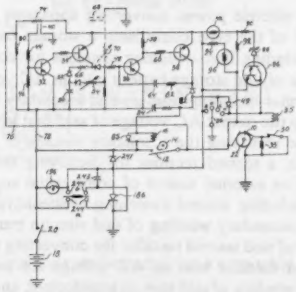
1. A direct current motor energizing circuit comprising a direct current motor, a bank of series connected batteries, said bank including opposite ends, and switch means for electrically disconnecting and connecting said bank to said motor, said switch means including means operable so that successive energizations of said motor are alternately from said opposite ends of said battery bank.

4,131,834

WINDSHIELD WIPER CONTROL SYSTEM

Henry Blaszkowski, P.O. Box 114, Southfield, Mich. 48075

Continuation of Ser. No. 549,810, Feb. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 302,940, Nov. 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 19,443, Mar. 13, 1970, abandoned, which is a continuation-in-part of Ser. No. 776,487, Nov. 18, 1968, abandoned. This application Feb. 3, 1977, Ser. No. 765,123
Int. Cl.² H02P 3/00
U.S. Cl. 318—483 **48 Claims**



1. An automatic control system for a windshield wiper mechanism driven by an electric motor comprising: sensing means adapted to be activated by the presence of moisture and de-activated by the absence of moisture; capacitance means; a first electronic control means adapted to charge the capacitance means upon each activation of the sensing means; second electronic control means driven by the capacitance means and

adapted to successively energize and de-energize the wiper motor following de-activation of the sensing means to produce an intermittent operation of the wiper motor which is sustained until the capacitance means are discharged, said first electronic control means also being adapted to energize the wiper motor continuously whenever and as long as said sensing means are or remain activated.

4,131,835

MICROPROGRAMMABLE CONTROL UNIT

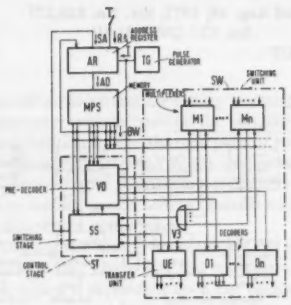
Heinrich Lange, Neubaldham, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 16, 1977, Ser. No. 797,341

Claims priority, application Fed. Rep. of Germany, May 21, 1976, 2622974

Int. Cl.² G05B *11/32, 19/28*

U.S. Cl. 318—562 **11 Claims**



1. A microprogrammable control unit for controlling a switching unit comprising:

a memory storing a microprogram of a plurality of command words, each of said command words including a predetermined number of binary characters;

an address register connected to said memory and storing the addresses of the command words;

a plurality of decoders for producing control signals for controlling the switching unit;

a plurality of multiplexers for connection to and interrogating conditions of the switching unit; and

a control stage connected to said memory for receiving command words, said control stage connected to said address register to said decoders and to said multiplexers, said control stage including means operable to switch through a plurality of binary characters of a command word to said decoders in response to a given first binary character of the command word having a first binary value, means operable to switch through said plurality of binary characters of the command word to said multiplexers in response to said given first binary character having a second binary value, and means operable to switch through the command word to said address register in response to a given second binary character of the preceding command word having a predetermined binary value.

4,131,836

INTERFERENCE PREVENTION SYSTEM FOR MACHINE TOOL MOVABLE MEMBERS

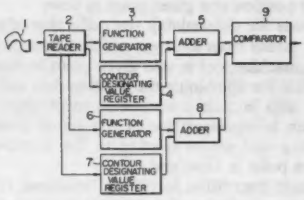
Shiro Noda, Nagoya, Japan, assignor to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Aug. 31, 1977, Ser. No. 829,519

Claims priority, application Japan, Sep. 10, 1976, 51-109036

Int. Cl.² G05B *23/02*

U.S. Cl. 318—565 **3 Claims**



1. In a machine tool including a plurality of movable members controlled to move independently and parallelly, a movable-member interference prevention system comprising a function generator for producing a signal representing an instantaneous position of a predetermined reference point on each of said movable members, contour designating-value setting means for setting contour designating value of each of said movable members, an adder for adding the output information of said function generator to the output information of said contour designating-value setting means, said function generator, said contour designating-value setting means and said adder being provided for each of said movable members, and means for determining whether said movable members interfere with each other by comparing and calculating the output information produced from said adders.

4,131,837

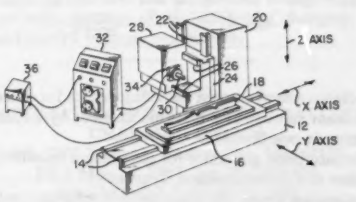
MACHINE TOOL MONITORING SYSTEM

William J. Whetham, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 740,627, Nov. 10, 1976, abandoned, which is a continuation-in-part of Ser. No. 596,709, Jul. 17, 1975, abandoned. This application Jul. 13, 1977, Ser. No. 815,150

Int. Cl.² G05B *13/00*

U.S. Cl. 318—571 **7 Claims**



1. In a numerical control machine tool comprising:

(a) first means for supporting a workpiece relative to a machine reference position such that the position of the workpiece can be ascertained;

(b) second means for supporting a cutting tool means relative to said machine reference position such that the undeflected position of the cutting tool means can be ascertained;

(c) cutting tool means operable to remove material from the workpiece when the machine tool is in operation, said cutting tool means deflecting from a rest position during removal of material from the workpiece;

(d) means for moving said first and second supporting means

such that the workpiece and the cutting tool move relative to each other;

(e) means for controlling the movement of the first and second supporting means in accordance with programmed instructions, so as to produce a product of selected configuration and size;

the improvement comprising:

(a) means for determining the position of said first and second supporting means relative to the machine reference position at a given point in time;

(b) means for determining the deflection of said cutting tool means from said rest position during operation of said machine tool at said given point in time;

(c) means for combining the position data and the deflection data in such a manner as to produce a resultant which is representative of the actual position of the cutting tool means relative to the workpiece at said given point in time; and

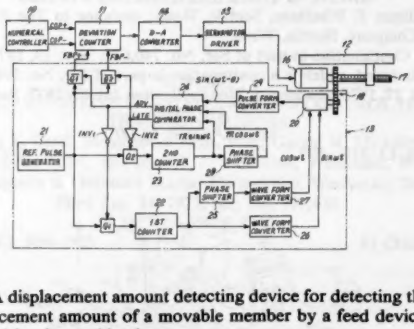
(d) means responsive to (1) said resultant, (2) reference data representative of the desired position of the cutting tool means relative to the workpiece at said given point in time, and (3) a preestablished tolerance value to alter the operation of said machine tool, when the difference between said resultant and said reference data reaches a predetermined fraction of said tolerance value, in such a manner as to insure that said product will be within the preestablished tolerance.

4,131,838

DISPLACEMENT AMOUNT DETECTING DEVICE

Kunihiko Etoh, Toyota, and Katsumi Sugiura, Takahama, both of Japan, assignors to Toyoda-Koki Kabushiki-Kaisha, Aichi, Japan

Filed Aug. 9, 1977, Ser. No. 823,023
Claims priority, application Japan, Sep. 28, 1976, 51-116713
Int. Cl.[2] G05B *19/28*
U.S. Cl. 318—603 **7 Claims**



1. A displacement amount detecting device for detecting the displacement amount of a movable member by a feed device, comprising in combination:

a reference pulse generator for gnerating a train of reference pulses at a predetermined frequency,

first counting means for counting said reference pulses from said reference pulse generator so as to output carrier signals,

second counting means for counting said reference pulses from said reference pulse generator so as to output a dummy wave,

a transducer connected with said first counting means for receiving said carrier signals and for generating a phase modulated signal proportional to the displacement of said movable member,

a phase comparator connected with said second counting means and said transducer for comparing said modulation signal with said dummy wave and adapted to output a first gate signal while the phase of said phase modulated signal leads the phase of said dummy wave and to output a second gate signal while the phase of said phase modulated signal lags the phase of said dummy wave,

output gate means connected with said reference pulse generator and said phase comparator for applying said reference pulses as output feedback pulses while receiving any one of said first and second gate signals, and

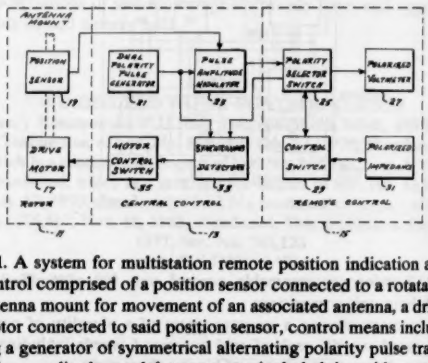
input gate means connected with said reference pulse generator and said first and second counting means for interrupting transmission of said reference pulses to said first counting means while receiving said first gate signal and for interrupting transmission of said reference pulses to said second counting means while receiving said second gate signal.

4,131,839

SYSTEM FOR MULTISTATION REMOTE POSITION INDICATION AND CONTROL

Barry R. Springer, 10301 Margarita Ave., Fountain Valley, Calif. 92708

Filed Aug. 19, 1977, Ser. No. 826,227
Int. Cl.[2] G05B *11/01*
U.S. Cl. 318—675 **2 Claims**

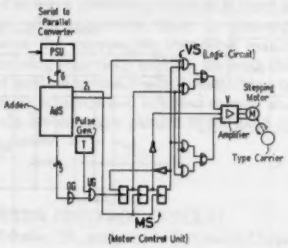


1. A system for multistation remote position indication and control comprised of a position sensor connected to a rotatable antenna mount for movement of an associated antenna, a drive motor connected to said position sensor, control means including a generator of symmetrical alternating polarity pulse train, pulse amplitude modulator means included in said control means, said pulse train being amplitude modulated in said modulator means according to the output of said position sensor, a remote sensor including a polarity selector switch having an input and selecting either the positive or negative pulse and also selects the opposing polarity pulse from the amplitude modulated pulse train, a polarized voltmeter receiving said positive or negative pulse for indication thereupon, a polarized impedance in said remote sensor, a control switch in said remote sensor receiving said opposing polarity pulse for selectively placing said polarized impedance across said input of said polarity selector switch to command the rotation of the associated antenna, a synchronous detector in said control means receiving said symmetrical alternating polarity pulse train and a polarized current pulse train significantly larger in magnitude than that generated by said polarized voltmeter, a motor control switch in said control means driven by said synchronous detector to rotate said associated antenna by rotation of said drive motor, the polarity of the current pulse train detected by said synchronous detector determining the direction of commanded rotation.

4,131,840
CIRCUIT ARRANGEMENT FOR SETTING A ROTATABLE TYPE CARRIER OVER THE SHORTEST PATH OF ROTATION

Wolfgang Wiesner, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 1, 1977, Ser. No. 820,795
Claims priority, application Fed. Rep. of Germany, Sep. 16, 1976, 2641760
Int. Cl.[2] G05B *19/40*
U.S. Cl. 318—685 6 Claims



1. A circuit arrangement for setting a rotatable type carrier, having character types carried on the periphery thereof, from one setting position by the shortest path of rotation to a new setting position, via a stepping motor, in response to pulse train elements derived from information characters input in binary coded form including new setting position and present setting position characters, comprising:

a first comparison means for receiving the new and present position setting characters and emitting a first evaluation signal which is dependent upon the values of said characters relative to one another, including first means for forming the sum of the binary value of the low-value character and the inverted binary value of the higher-value binary character, and second means for forming a binary value corresponding to half the number of possible setting positions of the type carrier;

a second comparison means connected to said first and second means and responsive to the binary values formed thereby to emit a second evaluation signal;

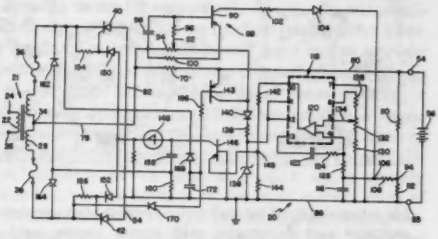
switching means connected to said first and second comparison means and operable in response to said second evaluation signal to switch through the determined binary spacing quantity as a drive value when the same is equal to or less than half the attainable type carrier setting positions and to switch through the difference quantity between half the number of attainable type carrier setting positions and the determined binary spacing quantity as a drive value when the determined binary spacing quantity is greater than half the number of attainable type carrier spacing positions;

EXCLUSIVE-OR logic means connected to said first and second comparison means and responsive to said first and second evaluation signals emits a control command to produce an oppositely directed rotation of the drive motor, in the presence of a new setting position character, when the new position character is greater than the present position character or when the determined spacing is greater than half the attainable setting positions.

4,131,841
BATTERY CHARGER WITH AUTOMATIC CHANGE FROM CURRENT TO VOLTAGE MODE CONTROL

David H. Bennefeld, Anoka, Minn., assignor to Introl Corp., Minneapolis, Minn.

Continuation-in-part of Ser. No. 577,175, May 14, 1975, Pat. No. 4,019,111. This application Aug. 19, 1976, Ser. No. 715,718
Int. Cl.[2] H02J *7/04*
U.S. Cl. 320—23 7 Claims



1. A battery charger for connection to a source of AC power comprising:

rectifier means for supplying charging current to a battery;

a magnetically decoupled transformer having a primary coil connected to the source of AC power, a secondary coil connected to said rectifier means, and a magnetic shunt path for a portion of the magnetic flux generated by said primary coil for limiting said charging current to a predetermined maximum value;

a resistor in series with said rectifier means and having a voltage drop thereacross generated by the flow of charging current therethrough;

circuit means responsive to said voltage drop for providing a first voltage signal representative of the amount of charging current being supplied to the battery by said rectifier means;

a voltage divider in parallel with the battery, said voltage divider providing a second voltage signal representative of the battery voltage;

means for controlling said rectifier means in accordance with said first and said second voltage signals to increase the flow of charging current when the battery voltage is below a threshold value and to decrease the flow of charging current when the battery voltage reaches said threshold value, said controlling means further comprising:

means for providing a summing point for algebraically summing said first and said second voltage signals that are representative of the amount of charging current and battery voltage, respectively.

4,131,842
AUTOMATIC SPRING-POWERED BATTERY CHARGING DEVICE

James Smith, 2503 Prospect, Kansas City, Mo. 64127

Filed May 25, 1977, Ser. No. 800,415
Int. Cl.[2] H02J *7/00*; F03G *1/00*
U.S. Cl. 320—61 5 Claims

1. A mechanism for applying charging current to a battery, said mechanism comprising:

a frame;

a coil spring mounted on said frame for coiling and uncoiling movement, said spring presenting a plurality of convolutions coiled about a center of the spring;

a drive gear mounted for rotation on said frame and coupled with said coil spring in a manner to rotate in response to uncoiling of said spring;

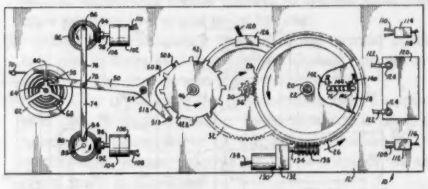
a mechanical linkage coupled with and driven by said drive gear;

battery charging means driven by said linkage and operable to apply charging current to the battery;

power means for winding up said coil spring;

a switch actuator carried on one of the convolutions of said coil spring in projection therefrom, said switch actuator moving with said one convolution along a generally linear path toward and away from the center of said spring as said spring coils and uncoils;

first and second switches for said power means mounted on said frame at spaced locations along said path and opera-



ble when engaged by said switch actuator to respectively energize and deenergize said power means, said first switch being located to be engaged by said actuator when said spring has uncoiled below a first preselected tension level and said second switch being located to be engaged by said actuator when said spring has been wound up above a second preselected tension level greater than said first level, whereby said spring is maintained between said first and second tension levels.

4,131,843

HIGH TENSION VOLTAGE SOURCE

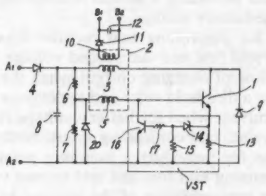
Masateru Koyama, Suita, and Kazuo Arakawa, Toyonaka, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 2, 1976, Ser. No. 746,749

Claims priority, application Japan, Dec. 9, 1975, 50-147219; Dec. 18, 1975, 50-171768

Int. Cl.² G05F *1/58*; H02P *13/24*

U.S. Cl. 323—9 **8 Claims**



1. A high tension voltage source comprising:

a step-up transformer having a plurality of coupled windings including a primary power input winding adapted to be connected to a power source, a secondary winding, and a feedback winding;

an electronically controlled switch connected to said power input winding, said switch having a controlling terminal connected to said feedback winding for controlling the conduction of said switch;

control circuit means connected to said controlling terminal for limiting the peak current through said power input winding including an impedance element connected to said switch in a manner that said power input winding, said switch and said impedance element are connected in series across said power source and a zener diode connected to said impedance element to make said switch non-conductive when the voltage across said impedance element exceeds a predetermined value, causing said zener diode to become conductive;

a high tension rectifying element connected to said secondary winding; and

a diode connected to said feedback winding and said impedance element so that the current generated in said feedback winding flows in a circuit comprising said feedback winding said controlling terminal of said switch, a switching terminal of said switch, said impedance element and said diode.

4,131,844

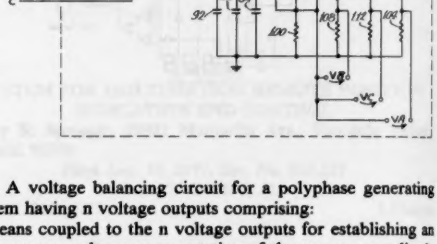
STATIC VOLTAGE BALANCER

David J. Hucker, Rockford, Ill., and Norbert L. Schmitz, Middleton, Wis., assignors to Sundstrand Corporation, Rockford, Ill.

Filed May 19, 1977, Ser. No. 798,602

Int. Cl.² G05F *1/30*

U.S. Cl. 323—45 **15 Claims**



1. A voltage balancing circuit for a polyphase generating system having n voltage outputs comprising:

means coupled to the n voltage outputs for establishing an average voltage representative of the average amplitude of the voltages from the n outputs;

means for establishing n error signals, one for each of the n voltage outputs, said n error signals representative of any difference between the average voltage and each of the voltages from the n outputs;

means responsive to the n error signals for providing n trim voltages, one for each of the n voltage outputs; and

means for summing the n trim voltages with the n voltage outputs so that the amplitude of each of the n voltage outputs equals the average value of the amplitude of the voltage from the n outputs.

4,131,845

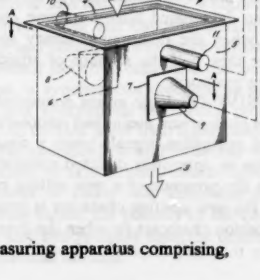
MICROWAVE MOISTURE SENSOR CHUTE

Ivars E. Pakulis, Norridge, Ill., assignor to Kay-Ray, Inc., Arlington Heights, Ill.

Filed Oct. 3, 1977, Ser. No. 838,505

Int. Cl.² G01R *27/04*

U.S. Cl. 324—58.5 A **24 Claims**



1. Moisture measuring apparatus comprising,

chute means of a given length for receiving moisture containing material, said chute means having walls with window opening means through which microwaves are transmitted,

transmitter means aligned with first of said window opening means for transmitting microwaves into said material such that said microwaves are attenuated by the moisture contained in said material, and

receiver means aligned with second of said window opening means for receiving at least part of said microwaves transmitted by said transmitter means,

wherein the walls of said chute means are all lined along an inside surface thereof with microwave absorbent material to reduce microwave reflections in the inside area of the chute means,

wherein said microwave absorbent material is lined along its inside surface with protective liner to prevent direct contact between the microwave absorbent material and moisture containing material travelling through the chute,

wherein each of said microwave window opening means is provided with flat microwave window means, and

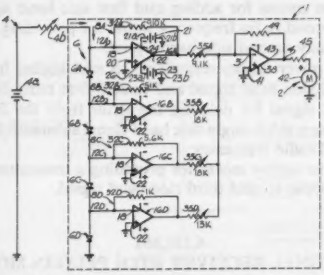
wherein said walls are mutually parallel in the axial direction of said chute means.

4,131,846

METER CONTROL CIRCUIT

Dennis C. Stone, Roselle, Ill., assignor to Dynascan Corporation, Chicago, Ill.

Filed Jun. 13, 1977, Ser. No. 805,722
Int. Cl.[2] G01R *15/10*; G06G *7/26*
U.S. Cl. 324—132 **3 Claims**



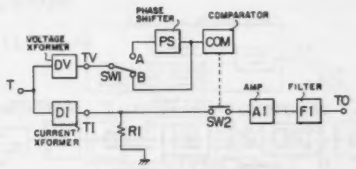
1. In combination with a meter movement having a pointer movable over a variable value indicating scale having numbered variable value indicating marks forming respective scale segments having substantially different compression or expansion ratios and representing progressively increasing variable values over the entire extent of said segments, a meter control circuit for feeding current to said meter movement to provide meter indications of an electrical variable which may have a value within a range from a relatively low minimum value to a relatively large maximum value as indicated by the movement of said pointer over said scale segments, said meter control circuit comprising: respective amplifier circuits for controlling the variation of pointer movement over said respective segments of said scale, each of said amplifier circuits being capable of producing an output which reaches a maximum possible output level when the signal fed to the input thereof is of a value which is to move the pointer of said meter movement to the uppermost point of the associated scale segment, said amplifier circuits including operational amplifiers each having an output terminal, a positive input terminal, a negative input terminal and positive and negative supply terminals, and a feedback resistor connected between each output terminal and a corresponding input terminal so that input current flows through said feedback resistor into the output terminal of the operational amplifier, the other input terminal of each operational amplifier being at the same reference potential, each feedback resistor being of a value so that the flow of the total increment of current to be handled by the amplifier involved results in a voltage drop which saturates the operational amplifier; means for summing the outputs of said respective amplifier circuits and feeding the same to said meter movement; an input circuit for carrying electrical current which varies over a range of values from a relatively low minimum value to a relatively large maximum value which will cause the meter movement pointer to span all of said segments of said scale; and signal directing means for respectively directing to said amplifier circuits signals resulting from the flow of respective incremental ranges of current values in said input circuit to cause said meter movement pointer to traverse said respective segments of said scale, said signal directing means including a series of similarly oriented series connected rectifiers arranged to pass the input current, the opposite terminals of said series of connected rectifiers being connected between the corresponding input terminals of the amplifiers which are to amplify successive incremental portions of the input current, each of said operational amplifier circuits maintaining said corresponding input terminal to which the feedback resistor is connected at said reference potential until the operational amplifier has become saturated, whereupon the voltage at said later input terminal will increase to enable conduction of the next increment of the input signal through the rectifier connected thereto which directs the current to the corresponding input terminal of the operational amplifier to handle the next incremental portion of the input signal.

4,131,847

DEVICE FOR MEASURING ACTIVE AND/OR REACTIVE COMPONENT OF AC CURRENT OR AC POWER

Masayuki Kohga, Tokyo, and Katsuto Ishii, Tama, both of Japan, assignors to Shoei Electric Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1977, Ser. No. 811,990
Claims priority, application Japan, Jul. 3, 1976, 51-79287
Int. Cl.[2] G01R *7/00*
U.S. Cl. 324—141 **14 Claims**



1. A device for measuring active and/or reactive component of AC current comprising:

first means for detecting an AC voltage of an AC circuit;

second means for detecting an AC current flowing through the AC circuit;

third means for generating a pulse signal lasting over a selected one-half cycle of the two opposite half cycles constituting one AC cycle of the AC output voltage of said first means;

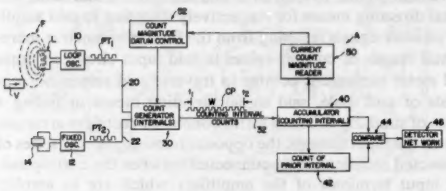
fourth means connected to said second and third means for controlling transmission of the output AC signal of said second means in response to said pulse signal; and

fifth means connected to said fourth means for delivering the signal corresponding to the signal controlled by said fourth means as an output signal.

4,131,848
DIGITAL LOOP DETECTOR WITH AUTOMATIC TUNING

Francis L. Battle, Austin, Tex., assignor to Gulf & Western Industries, Inc., New York, N.Y.

Filed Dec. 3, 1976, Ser. No. 747,171
Int. Cl.² G01R *33/12*; G08G *1/01*
U.S. Cl. 324—236 **25 Claims**

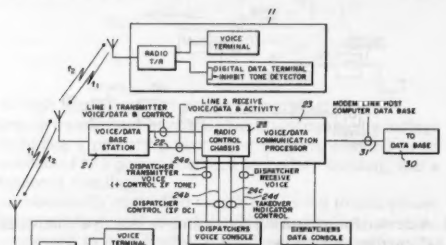


1. In a digital device for detecting a metal object in the field of influence of a detector loop controlling an oscillator, said digital device including means for creating a series of counting intervals; pulse counting means for counting pulses during a current counting interval, with the magnitude of the pulse count during an interval being indicative of metal detected by said loop; means for storing a pulse count of a prior counting interval; and means for indicating a detection when said pulse count of a current interval differs from said stored pulse count by at least a selected amount, the improvement comprising: reading means for creating a signal when said pulse count of a counting interval differs in a selected numerical direction from a selected count magnitude, and shifting means responsive to said signal for shifting the length of subsequent counting intervals toward a length producing a pulse count including said selected count magnitude.

4,131,849
TWO-WAY MOBILE RADIO VOICE/DATA SHARED COMMUNICATIONS SYSTEM

Thomas A. Freeburg, Arlington Heights; Manohar A. Joglekar, Elk Grove Village, and Lawrence R. Pajakowski, Schaumburg, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 21, 1976, Ser. No. 734,493
Int. Cl.² H04B *7/00*
U.S. Cl. 325—54 **5 Claims**



1. A control circuitry for a two-way mobile radio voice/data shared communications system including a plurality of mobile stations with data and voice terminals, a base station, a dispatching station for voice and data, a voice/data processor interposed between the voice/data dispatching station and the base station, said control circuitry including:

means for enabling the base station to receive the inbound voice signal from a mobile station and rebroadcast the inbound voice signal to the other mobile stations,

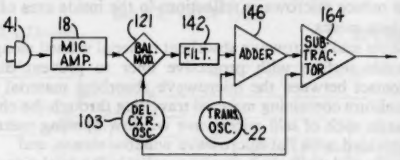
means responsive to the inbound voice signal for inhibiting transmission of digital data signal from any of the mobile terminals to the base station, and

means for independently transmitting outbound digital data or voice signal from the dispatching station.

4,131,850
SINGLE SIDE BAND RADIO APPARATUS

Glade Wilcox, 1407 Knollwood Ave., Kalamazoo, Mich. 49007

Filed Feb. 18, 1977, Ser. No. 769,899
Int. Cl.² H04B *1/66*
U.S. Cl. 325—137 **15 Claims**



1. A single side band radio transmitter, comprising:

a first radio frequency signal source means for supplying a first radio frequency carrier signal;

modulating signal means for supplying an audio frequency modulating signal;

means including a balanced modulator means for modulating said first radio frequency carrier signal with said modulating signal and therefrom providing a first side band signal;

second radio frequency signal source means for supplying a second radio frequency signal;

add mixer means for adding said first side band signal and said second radio frequency signal for providing a higher frequency second side band signal;

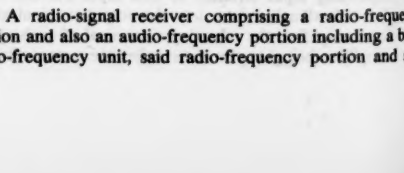
subtract mixer means responsive to said higher frequency second side band signal and to said first radio frequency carrier signal for deleting the latter from the former to produce a third single side band signal substantially at said second radio frequency;

transmitter output means for providing a transmitter output in response to said third side band signal.

4,131,851
RADIO-SIGNAL RECEIVER WITH PLUG-IN MODULES

Wolfgang Martiny, Lampertheim, Fed. Rep. of Germany, and Donald H. MacGillavry, Reithoven, Belgium, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Aug. 24, 1976, Ser. No. 717,409
Claims priority, application Fed. Rep. of Germany, Mar. 1, 1976, 2608359
Int. Cl.² H04B *1/08*
U.S. Cl. 325—355 **13 Claims**



1. A radio-signal receiver comprising a radio-frequency portion and also an audio-frequency portion including a basic audio-frequency unit, said radio-frequency portion and said

basic audio-frequency unit being mounted in the interior of a common housing,

said housing being provided with recess means accessible from the outside of the housing, said recess means, being sealed off from the interior of the housing and receiving at least one modular plug-in unit having the components of one or more auxiliary circuit modules enclosed therein, and said modular unit having thereon a plurality of contacts cooperating with a plurality of mating contacts in said recess means of the housing which are connected to circuit points in said audio-frequency portion, the circuit through at least predetermined ones of said circuit points being normally interrupted and at least one of said enclosed modular plug-in units being provided with linking connections for bridging said predetermined circuit points when said modular unit is inserted into said recess means of said housing,

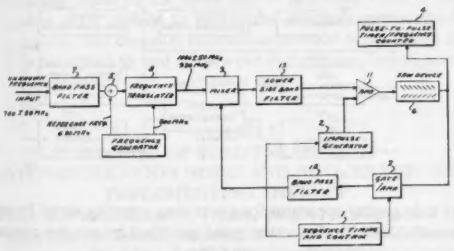
such that said modular unit, upon being plugged in, effectively supplements said basic audio-frequency unit, circuitwise, with said auxiliary circuit module.

4,131,852

SINGLE DISPERSIVE DELAY LINE COMPRESSIVE RECEIVER

Ervin K. Holland-Moritz, Ann Arbor, Mich., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sep. 28, 1977, Ser. No. 837,135
Int. Cl.[2] H04B *17/00*
U.S. Cl. 325—363 **2 Claims**



1. A compressive receiver for determining the frequency of a received signal occurring within a prescribed acceptance band, comprising:

(a) a surface acoustic wave dispersive delay line having a frequency band wider than said acceptance band;

(b) means for applying a short impulse to the input of said delay line for producing at its output a downchirp signal of the same bandwidth as the line;

(c) means providing a reference frequency lying just outside said acceptance band;

(d) means for translating said acceptance band and said reference frequency by a fixed amount such that the difference between the center frequency of the translated band and the center frequency of said downchirp is at or near the center frequency of said delay line band;

(e) means for deriving the difference between any frequency in said translated band and said downchirp, and the difference between said reference frequency and said downchirp, said difference in each case constituting an upchirp of the same bandwidth as said downchirp;

(f) means for applying said upchirps to the input of said delay line whereby a pair of pulses appears at the delay line output due to compression of said upchirps; and

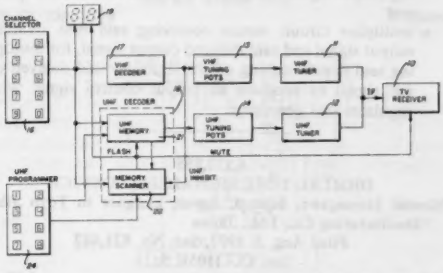
(g) means for measuring the interval between the pulses of said pair, said interval being a measure of the frequency of said received signal.

4,131,853

ELECTRONIC MULTIPLE CHANNEL TUNER

Erwin J. Dreiske, Athens, Tex., assignor to Curtis Mathes Manufacturing Co., Athens, Tex.

Filed Dec. 22, 1976, Ser. No. 753,601
Int. Cl.[2] H04B *1/26*
U.S. Cl. 325—464 **15 Claims**



1. A multiple channel tuner, comprising:

means for tuning each of a plurality of signal channels;

a memory with plural channel indicia stored at discrete addresses, the tuning means for each channel being operatively associated with the respective memory address;

means for selecting a desired signal channel and for generating channel representing indicia corresponding thereto;

means for comparing the selected channel representing indicia with channel indicia stored at various addresses in said memory; and

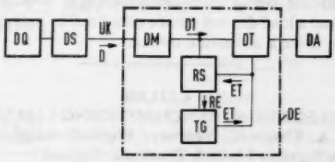
means operative if the selected channel representing indicia corresponds with stored channel indicia, and responsive to said comparing means for actuating the tuning means for the selected channel.

4,131,854

SWITCHING CIRCUIT FOR REGULATING THE REPETITION RATE OF CLOCK PULSES

Gero Schollmeier, Gauting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 15, 1977, Ser. No. 816,081
Claims priority, application Fed. Rep. of Germany, Jul. 16, 1976, 2632165
Int. Cl.[2] H03B *3/04*
U.S. Cl. 328—63 **3 Claims**



1. A switching circuit for regulating the repetition rate of clock pulses generated by a clock pulse generator, said generator determining the sampling instants at which a data signal transmitted from a data transmitter to a data receiver is sampled comprising:

a threshold means coupled to said data signal for producing a desired value signal which represents the desired value of said data signal;

a first switching means, receiving said data signal and said desired value signal, for producing a first switching output signal which represents the sign of the difference between

said desired value signal and said data signal at said sampling instants;

a second switching means, receiving said desired value signal, for producing a second switching output signal which represents the sign of said desired value signal;

a delayed circuit means, receiving said second switching output signal and said clock pulses, for producing a delayed output signal which represents said second switching output signal delayed by a period of said clock pulses; and

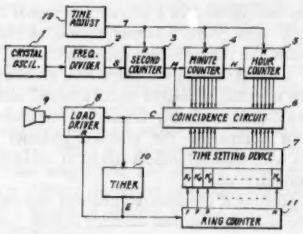
a multiplier circuit means, receiving said first switching output signal and said delayed output signal, for multiplying said first switching output signal by said delayed output signal to produce an output control signal which regulates said generator.

4,131,855

DIGITAL TIME SIGNALLING DEVICE

Hiroshi Hamagawa, Himeji, Japan, assignor to Toyo Jihoki Manufacturing Co., Ltd., Japan

Filed Aug. 3, 1977, Ser. No. 821,482
Int. Cl.[2] H03K *5/13*
U.S. Cl. 328—129 **6 Claims**



1. A digital time signalling device comprising a pulse generating circuit for generating clock pulses of one Hertz frequency, a first counter for counting said clock pulses to produce output pulses at intervals of sixty (60) counts, a second counter for counting the output pulses of said first counter to produce a coded count output every count and also produce output pulses at intervals of sixty (60) counts and being reset in response to said output pulses, a third counter for counting the output pulses of said second counter to produce a coded count output every count and being reset at intervals of twenty-four (24) counts, a time setting device for storing a time to be signalled and producing a coded output representing said time, a coincidence circuit for comparing the coded count outputs of said second and third counters with the coded output of said time setting device for all bits at the same time and producing a coincidence signal when coincidence is obtained therebetween, and a load driving device energized by said coincidence signal to drive a utilization device.

4,131,856

ELECTRICAL SYNCHRONIZING CIRCUITS

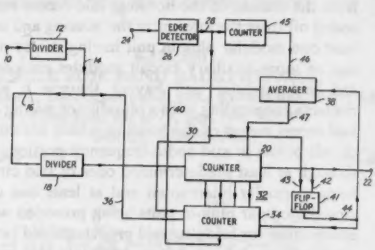
Robert A. Chapman, Newbury, England, assignor to Racal Group Services Limited, Bracknell, England

Filed Aug. 22, 1977, Ser. No. 826,838
Claims priority, application United Kingdom, Sep. 1, 1976, 36129/76
Int. Cl.[2] H03B *3/04*
U.S. Cl. 328—155 **15 Claims**

1. An electrical circuit arrangement for phase-synchronising a first pulse train with a second pulse train, comprising

phase difference measuring means connected to respond to both said pulse trains and operative during each of a predetermined number of periods of one of the pulse trains to measure the algebraic phase difference between the pulses of the two pulse trains,

averaging means connected to the phase difference measuring means for determining the algebraic average of the phase differences over the said predetermined number of periods, and



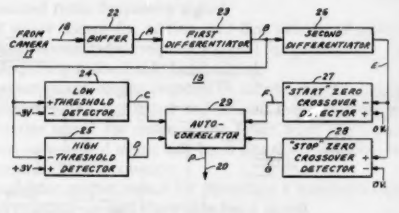
phase adjusting means operative to adjust the absolute phase of the pulses of the first pulse train in correspondence with the said algebraic average of the phase differences so as to bring the two pulse trains closer into phase equality.

4,131,857

AUTOCORRELATED PULSE PROCESSOR

John C. Clymer, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Mar. 17, 1977, Ser. No. 778,511
Int. Cl.[2] H03K *1/02, 1/10*
U.S. Cl. 328—163 **6 Claims**



1. In gaging apparatus for generating a gaging signal having a variablewidth dimension pulse modified by a noise component, a pulse processor comprising:

(a) first circuit means receiving the gaging signal for producing start signals responsive to detecting a leading edge of the dimensional pulse,

(b) second circuit means associated with the first circuit means for producing stop signals responsive to detecting a trailing edge of the dimensional pulse,

(c) either the timing or waveform, or both, of each said dimensional pulse edges being modifiable by noise, and

(d) autocorrelator means connected to the first and second circuit means for removing noise therefrom, and including separate start and stop circuit means responsive to the start and stop signals for producing a variable-width output pulse having precisely occurring leading and trailing edges unaffected by noise and which accurately define a gaging dimension.

4,131,858

BEAM LEAD DUAL PARAMETRIC AMPLIFIER

Edward C. Niehenke, and Gerald I. Klein, both of Baltimore, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 30, 1977, Ser. No. 856,052
Int. Cl.[2] H03F *7/04*
U.S. Cl. 330—4.9 **18 Claims**

1. A balanced parametric amplifier, comprising:

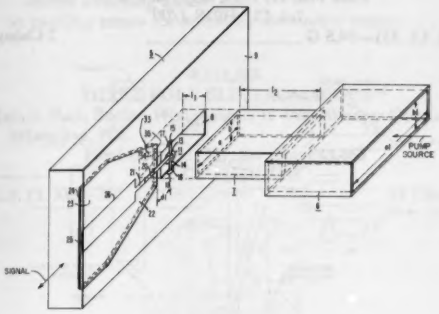
a plate for providing a conductive path for electrical cur-

rents, said plate having a first surface and a second adjoining surface forming an angle with said first surface;

a microwave waveguide cavity formed in said first surface and communicating with said second surface;

a microwave transmission line to provide a microwave signal circuit, said line extending to a position adjacent to the cavity at the second surface of the plate;

a pumping circuit assembly coupled to said microwave waveguide cavity and said first plate surface; and



an assembly including a pair of balanced Schottky beam lead varactor diodes fabricated on a single semiconductor chip with a common cathode connection, each having a beam lead anode extending outwardly therefrom, said diodes being joined by the outer ends of said beam leads to said first plate surface to bridge the microwave waveguide cavity, said common cathode connection being joined by a beam lead to said microwave transmission line adjacent to the microwave waveguide cavity.

4,131,859

METHOD OF COMPENSATION OF INTERMODULATION NOISE AND DEVICES FOR THE IMPLEMENTING THEREOF

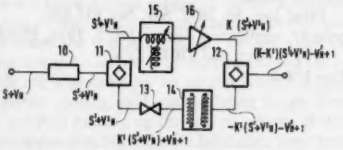
Pierre D. Valle, Colombes, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Oct. 4, 1977, Ser. No. 839,170

Claims priority, application France, Oct. 13, 1976, 76 30741

Int. Cl.[2] H03F *1/26, 3/68*

U.S. Cl. 330—124 R **7 Claims**



1. A method of reducing the intermodulation noise in an analog transmission system of the type that includes a plurality of cascaded repeaters, which comprises the steps of:

(a) applying the output signal from said transmission system to a phase-correcting network to at least partially compensate for the phase-distortion and phase-discontinuities caused by said cascaded repeaters;

(b) applying the output of said phase-correcting network to the input of a source of a compensating, intermodulation noise signal; and

(c) combining the output signal from said compensating source with a gain-modified version of the output signal from said phase-correcting network in such a way that the intermodulation noise components of significance are cancelled.

4,131,860

POWER AMPLIFIER ARRANGEMENT AUTOMATICALLY MATCHED TO SERVICE CONDITIONS

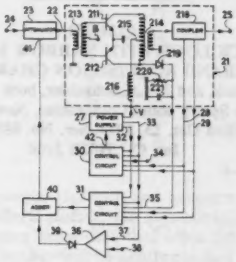
Jean-Jacques Fyot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Dec. 27, 1977, Ser. No. 864,720

Claims priority, application France, Dec. 31, 1976, 76 39716

Int. Cl.[2] H03G *3/30*

U.S. Cl. 330—279 **4 Claims**



1. A linear power amplifier arrangement having a signal input and a signal output, and comprising : a power amplifier stage having an input, and an output connected to said signal output; a power supply for delivering a d.c. voltage V for feeding said amplifier stage, having an electrical control input of said value V; an attenuator having an electrical control input for control of its attenuation value and connecting said amplifier arrangement input to said amplifier stage input; a first control circuit for keeping said voltage V permanently equal to an optimal value V_o corresponding to a power dissipated by said amplifier stage, irrespective of said value of attenuation, below a limit fixed in dependence upon predetermined reliability conditions; and a second control circuit for adjusting said attenuation value in order to ensure (i) to said output signal, a maximal peak voltage compatible with predetermined minimal linearity conditions of said amplifier arrangement (ii) to the average current I supplied by said power supply, a level below a predetermined value.

4,131,861

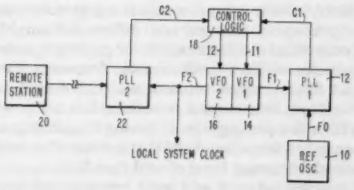
VARIABLE FREQUENCY OSCILLATOR SYSTEM INCLUDING TWO MATCHED OSCILLATORS CONTROLLED BY A PHASE LOCKED LOOP

Shashi D. Malaviya, Fishkill, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1977, Ser. No. 865,809

Int. Cl.[2] H03B *3/04;* **H03C** *3/00;* **H03D** *3/18*

U.S. Cl. 331—2 **9 Claims**



1. A variable frequency oscillator system with highly stable center frequency output signal comprising;

a stable reference frequency generating element providing a highly stable reference frequency output signal to a first phase locked loop;

first and second variable frequency oscillators having substantially matched characteristics, said first variable fre-

quency oscillator providing a second input to said first phase locked loop;

input means for providing a control signal to said second variable frequency oscillator;

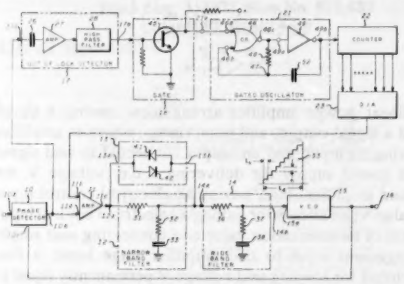
said first phase locked loop providing a correction signal to both said first and second variable frequency oscillators whereby said second variable frequency oscillator provides a highly stable output signal at a frequency closely approximating said reference frequency and variable in accordance with the input signal provided by said input means.

4,131,862

PHASE LOCK LOOP WITH NARROW BAND LOCK-IN AND WIDEBAND ACQUISITION CHARACTERISTICS

Stanley H. Black, and Jon A. Schneider, both of Phoenix, Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 13, 1977, Ser. No. 841,871
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—4 **9 Claims**



1. A phase lock loop with an acquisition bandwidth that is greater than the lock-in bandwidth comprising:

a differential amplifier having a first input terminal, a second input terminal, and an output terminal at which a signal is coupled that is representative of the difference between the signal coupled to said first and second input terminals;

oscillator means having an input terminal coupled to said output terminal of said differential amplifier for providing a signal at an output terminal thereof that is controlled in frequency by said signal at said output terminal of said differential amplifier;

a phase detector having a first input terminal coupled to receive an external signal having a predetermined frequency, a second input terminal coupled to said output terminal of said controlled oscillator means, and an output terminal coupled to said first input terminal of said differential amplifier at which a signal is coupled that is representative of the difference in frequency between signals coupled to said first and second input terminals of said phase detector;

a first filter, having an input terminal and an output terminal, serially coupled between said differential amplifier and said controlled oscillator means for passing signals having frequencies within a predetermined frequency band;

a second filter coupled between said differential amplifier and said oscillator means in serial relationship with said first filter for passing signals having frequencies within a pre-specified frequency band that is wider than said predetermined frequency band of said first filter;

means coupled between said input terminal and said output terminal of said first filter for switchably providing a direct path therebetween whenever said signal at said output terminal of said differential amplifier possesses a frequency that exceeds a specified bound; and

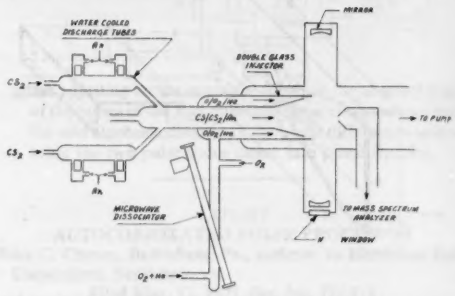
means coupled between said output terminal of said phase detector and said second input terminal of said differential amplifier for providing a ramp signal whenever said signal at said output terminal of said phase detector exceeds a predetermined frequency and to hold said ramp signal at a value required to achieve lock-in when said switch means provides said direct path between said input and output terminals of said first filter.

4,131,863

CO CHAIN REACTION CHEMICAL LASER

William Q. Jeffers, Florissant, and Harris Y. Ageno, Manchester, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 17, 1976, Ser. No. 658,497
Int. Cl.[2] H01S *3/00*
U.S. Cl. 331—94.5 G **2 Claims**



1. A method of producing a chain reaction CO chemical laser comprising the steps of

(a) mixing a CS-containing fuel in which the ratio of CS/CS_2 exceeds 0.2 with a stream of O_2 oxidizer and O-atom chain initiator such that more than one molecule of vibrationally-excited CO* is produced from a pumping reaction for each O-atom introduced into the mixture and resulting in an inverted population of CO*,

(b) passing said mixed stream through a resonant optical cavity to obtain continuous stimulated emission of radiation from the CO*, and

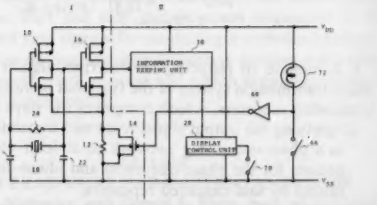
(c) extracting a coherent laser beam from the optical cavity.

4,131,864

LOW VOLTAGE COMPENSATOR FOR POWER SUPPLY IN A COMPLEMENTARY MOS TRANSISTOR CRYSTAL OSCILLATOR CIRCUIT

Takatoshi Kuzumoto, Yao; Kiyoshi Kumata, Tenri, and Keizo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 30, 1977, Ser. No. 811,860
Claims priority, application Japan, Jul. 1, 1976, 51-87656[U]
Int. Cl.[2] H03B *5/36*
U.S. Cl. 331—116 R **6 Claims**



1. In a complementary MOS transistor crystal oscillator circuit including two power supply terminals, a C-MOS inverter connected across said two power supply terminals, a quartz crystal vibrator connected between an input terminal and an output terminal of the C-MOS inverter, a first source resistor connected between the source of the N-channel tran-

sistor of the C-MOS inverter and one of said two power supply terminals, and a second source resistor connected between the source of the P-channel transistor of the C-MOS inverter and the other of said two power supply terminal, the improvement comprising:

a first switching means connected in parallel to the first source resistor;

a second switching means connected in parallel to the second source resistor;

a control means for causing the conduction of said first and second switching means; and

an enabling means for operating the control means.

4,131,865

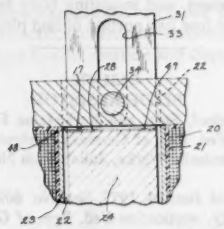
THREE POLE ELECTROMAGNET

John S. Hart, Racine, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Oct. 19, 1977, Ser. No. 843,463

Int. Cl.[2] H01F 7/08

U.S. Cl. 335—257 **12 Claims**



1. An electromagnet, which includes:

a housing;

a stationary core of ferromagnetic material disposed within the housing, the core having a base and a pair of legs extending substantially perpendicular from the base, said core having a center pole face and a pole face at the end of each leg;

a movable armature of ferromagnetic material having a center pole face and two end pole faces, the armature being disposed in the housing opposite the core so that each pole face on the core is opposite a pole face on the armature;

an energizing coil associated with said core, so that when the coil is energized a magnetic force is induced which moves the armature from an open position to a closed position in which a three-legged magnetic circuit is formed; and

a coating of non-magnetic material on a center pole face, so that when the coil is energized the end pole faces of the armature and core are in direct contact and the center pole faces are separated by an airgap which includes a non-magnetic coating, said coating being longer wearing then the material making up the end pole faces of the armature and core so that the end pole faces may wear more quickly than the coating on the center pole.

4,131,866

SOLENOID DEVICES

Alan C. Torr, Alvaston, England, assignor to Expert Industrial Controls Limited, Leicestershire, England

Filed Apr. 19, 1977, Ser. No. 788,894

Claims priority, application United Kingdom, May 1, 1976, 17871/76

Int. Cl.[2] H01F 7/16

U.S. Cl. 335—262 **11 Claims**

1. A solenoid device:

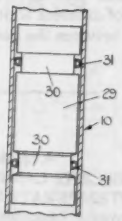
comprising a tube of circular cross-section;

an axially movable cylindrical armature mounted within the tube;

an electrical winding, said armature, when the winding is supplied with electric current, moving axially within the tube;

means for defining a circumferential recess with respect to the internal surfaces of the tube or armature; and

a rolling bearing means comprising an elongated resilient member in said recess, said member extending in a generally circumferential direction and having a substantially circular peripheral surface, the dimensions of said recess and said member being such that when the device is assembled the member will be lightly pinched between said tube and said armature but is capable of rolling within said recess during relative axial movement of said tube and said armature.



4,131,867

LAMP BALLAST ATTACHMENT DEVICE

Honesto D. Quiogue, Blacksburg, Va., assignor to Harvey Hubbell, Incorporated, Orange, Conn.

Filed Aug. 25, 1977, Ser. No. 827,454

Int. Cl.[2] H01F 15/02

U.S. Cl. 336—65 **21 Claims**

1. In a luminaire, the combination of a ballast having a core formed of a plurality of flat plates laminated together with edges thereof substantially coextensive to provide one end portion having a width dimension in a plane at generally right angles to the plane of the plates, internal wall portions of the core defining at least one elongated bore of substantially circular cross-section extending through the core and the opposite outer plates thereof, the bore being oriented with the longitudinal axis thereof substantially perpendicular to the plane of said outer plates, and a ballast support plate having a plurality of spaced-apart support openings in the support plate, each of the support openings being spaced from a respective, outermost core plate and having a major axis substantially at right angles to the longitudinal axis of the bore, wherein the improvement comprises, a plurality of elongated mounting devices located on opposite respective sides of the outermost core plates, each of said devices having a smooth, elongated shank with a substantially uniform cross-sectional dimension slightly less than the corresponding cross-sectional dimension of the bore, the shanks of the devices being slidably and coaxially disposed in a different respective end of the bore to have a free end projecting outwardly from the bore, the free end of each of said devices being spaced from the supporting surface by a predetermined distance, at least a portion of which comprises free unobstructed space, individual fastener means engaged with the free ends of said mounting devices and inserted into different ones of the support openings to urge said free ends toward the support plate, said fastener means having a major axis thereof intersecting the longitudinal axis of the bore for mounting each of the free ends of said mounting devices, the distance between opposite, individual fastener means being greater than

the width dimension of the largest ballast core to be mounted on the luminaire, the shank of each mounting device having a sufficient length for substantial portions of each shank to remain within a bore having a shorter length, corresponding to a ballast core having a smaller width dimension, than that of said largest core, the free end of each device having an aperture formed therein and being attached to said support by individual fastener means passing through each said aperture, whereby ballasts of different width dimensions are held on the luminaire by and between the devices.

4,131,868

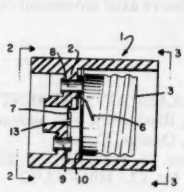
INCANDESCENT LAMP SOCKET HAVING OVERTEMPERATURE PROTECTOR

Joseph A. Dombrowski, Manchester; Clement T. Baxter, Beverly, both of Mass.; Frederick B. Howard, Cape Elizabeth, and George H. Simpson, Westbrook, both of Me., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 7, 1977, Ser. No. 774,825

Int. Cl.[2] H01H *61/01*

U.S. Cl. 337—113 **5 Claims**



1. A socket for an electric lamp comprising an insulative housing containing a threaded metal shell for screwing a lamp base thereinto, a spring metal contact within said housing for making contact with the center contact of the lamp base, means for supplying electric current to said threaded metal shell and said spring metal contact, and a thermal protector within said housing to interrupt the electric current when the socket becomes heated above a predetermined temperature, wherein said thermal protector is normally closed at the normal operating temperature of the socket but opens at a predetermined higher temperature.

4,131,869

PLUG-IN FUSE ASSEMBLY CONSTRUCTION

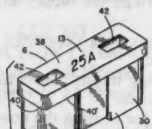
John Schmidt, Jr., Mount Prospect, and Avinash Aryamane, Elk Grove, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 698,079, Jun. 21, 1976, Pat. No. 4,023,264. This application Apr. 25, 1977, Ser. No. 790,665

Int. Cl.[2] H01H *85/22*

U.S. Cl. 337—264 **17 Claims**

1. A high current plug-in fuse assembly comprising: a plug-in fuse element including a pair of laterally spaced generally parallel confronting terminal portions, the terminal portions having current-carrying extensions projecting longitudinally from the inner end portions thereof and which are interconnected by a fuse link made of fuse metal, said fuse link extending between said current-carrying extensions at points much closer to said terminal portions than to the outer ends of said current-carrying extensions, and an insulating body rigidly anchored between said current-carrying extensions and made of a material which has a relatively low melting temperature in comparison to the blowing temperature of the fuse link of said



plug-in fuse element, said insulating body being substantially spaced from said fuse link portion of said plug-in fuse element.

4,131,870

SLIDE RESISTOR

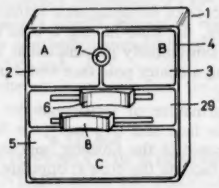
Joachim Hilgendorf, Salz, and Karl-Heinz Funke, Bad Neustadt, both of Fed. Rep. of Germany, assignors to Preh, Elektro-Feinmechanische Werke, Jakob Preh Nachf, Fed. Rep. of Germany

Filed Jun. 24, 1977, Ser. No. 809,868

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1976, 7620297[U]

Int. Cl.[2] H01C *10/44*

U.S. Cl. 338—183 **12 Claims**



1. A slide resistor comprising

(a) collector means of high electrical conductivity formed as an elongate structure of generally U-shaped cross-section and having a pair of legs and a first slot therebetween.

(b) resistance means including an insulating support mounted on a first one of said pair of legs and carrying a resistance layer facing the second one of said pair of legs, and

(c) slider means guided between said pair of legs and including contact spring means contacting said collector means and said resistance layer, and an actuating member engaging said contact spring means and extending through said first slot for operation from outside said collector means.

4,131,871

ELECTRICAL DEVICE AND METHOD

Donald L. Haag, Sterling, and Lee O. Woods, Morrison, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

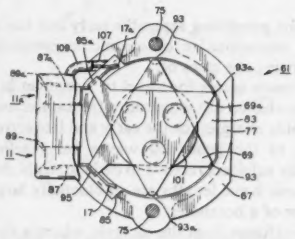
Filed Jan. 24, 1977, Ser. No. 761,584

Int. Cl.[2] H01C *13/00*

U.S. Cl. 338—220 **27 Claims**

1. An electrical device adapted to be associated in electrical mounting engagement with a pair of stationary male mounting terminals for connection in circuit relation with a winding circuit of a dynamoelectric machine, the electrical device comprising a casing; a plurality of wall means on said casing

defining a chamber therein and including a pair of opposed end walls, and a sidewall interposed between said end walls; a PTCR; a pair of contact plates disposed in electrical and supporting engagement across said PTCR and mounted in said chamber between said end walls; means on said contact plates for positioning engagement with said sidewall, respectively; first and second apertures in said casing and extending through said sidewall so as to communicate with said chamber; said chamber including recess means in said sidewall and intersecting with at least one of said first and second apertures; first and second female terminals of a generally thin metal having good electrical conductive characteristics and respectively including first and second electrical connector sections generally confined in said first and second apertures and adapted for the association in the electrical mounting engagement with the male mounting terminal pair, and first and second supporting sections integral with said first and second electrical connector sections for connection in electrical conductive engagement with said contact plates; a first end portion of said first supporting section disposed in said chamber and connected in the electrical conductive engagement with one of said contact plates; said second electrical connector section including a split sleeve portion in said second aperture and disposed for limited



displacement movement therein, an opening in said split sleeve portion generally aligned with said second aperture and in which one of the male mounting terminals may be received upon the association in the electrical mounting engagement of the first and second electrical connector sections with the male mounting terminal pair; said second supporting section being disposed generally in said recess means and including a distal end portion spaced from said split sleeve portion, a first leg integrally formed between said split sleeve portion and said distal end portion, a second leg integrally formed with said distal end portion and extending generally in laterally spaced relation with said first leg, a second end portion on said second leg spaced generally adjacent said split sleeve portion and connected in the electrical conductive and mechanical engagement with the other of said contact plates, and at least one of said first leg and said second leg including a section operable generally to yield in the event of the occurrence of the displacement movement of the split sleeve portion in said second aperture upon the association of said first and second electrical connector sections in the electrical mounting engagement with the male mounting terminal pair so as to at least in part limit the translation of the displacement movement of said split sleeve portion through the second supporting section to said other contact plate.

4,131,872

ULTRASONIC WAVE ECHO-TYPE SWITCH

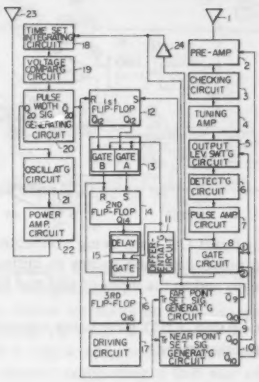
Hiromitsu Inoue, Kyoto; Susumu Katayama, and Hiroshi Ohashi, both of Hirakata, all of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Dec. 9, 1976, Ser. No. 749,072

Claims priority, application Japan, Dec. 15, 1975, 50-149810; Dec. 15, 1975, 50-149826; Jun. 14, 1976, 51-69520

Int. Cl.[2] G01S *9/66*

U.S. Cl. 340—1 R **5 Claims**



1. An ultrasonic wave echo-type switch comprising:
an oscillator for generating an ultrasonic wave,
an emitter excited by an output of said oscillator to radiate the ultrasonic wave into air,
a receiver for receiving any reflected ultrasonic wave from an object to be detected,
a wave-receiving timing control section determining a timing period for confirming the reflected wave,
a reflected wave confirming section for confirming whether any reflected wave is received during said timing period,
a received wave confirming section for confirming that the reflected wave is received during at least two successive timing periods,
a reset operating section for reseting the received wave confirming section in the absence of the received wave during the timing period,
an input absence detecting section for detecting that no input to the receiver continues for a fixed time after the timing period and providing a next wave radiation controlling signal in response to such detection, and
a next wave radiation controlling section for controlling the next wave radiation responsive to said signal of the input absence detecting section.

4,131,873

SLANT RANGE AND DIRECTION DETECTOR

William B. Anderson, Silverdale, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 31, 1977, Ser. No. 764,483

Int. Cl.[2] G01S *3/80*

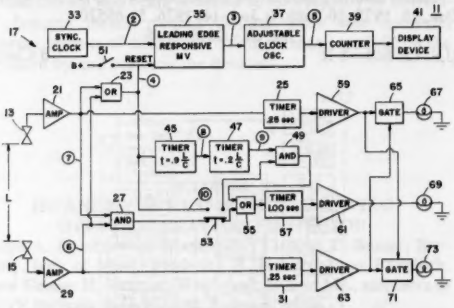
U.S. Cl. 340—6 R **8 Claims**

1. A range and direction detector for determining the range and direction of an underwater object emitting an acoustic signal having a predetermined repetition frequency comprising:
(a) first and second hydrophone receivers;
(b) a synchronous clock for providing an output signal that is synchronized with said acoustic signal;
(c) an OR gate and an AND gate;
(d) the output of said first hydrophone connected to one input of said AND gate and to one input of said OR gate,

the output of said second hydrophone connected to the other input of said AND gate and to the other input of said OR gate;

(e) a range detection means;

(f) a direction detection means including an end fire detection means and a broadside detection means;



(g) the output of said OR gate being connected to a reset input of said range detection means to initiate the range detection means and to the input of said end fire detection means;

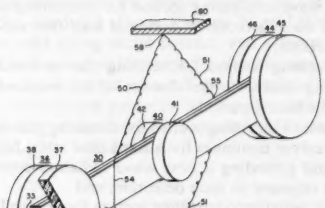
(h) the output of said AND gate being connected to said broadfire detection means.

4,131,874

INERTIAL BALANCED DIPOLE HYDROPHONE

Kenneth P. Geohegan, Jr., Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1977, Ser. No. 796,243
Int. Cl.[2] H04B *13/00*
U.S. Cl. 340–10 **20 Claims**



1. An inertia balanced hydrophone for detection of acoustic signals in an underwater environment comprising:

(A) a piezoelectric bender unit having at least one bender node;

(B) means for supporting said bender unit at said node,

(C) electrical leads connected to said bender unit to provide an output signal;

(D) at least first and second masses affixed to said bender unit at spaced apart locations with said node between them;

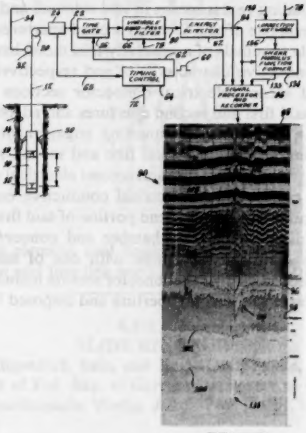
(E) said first and second masses being of respective sizes, masses and shapes that the acceleration of said masses are different in response to the same acoustic signal but are the same in response to physical movement of said support means whereby the output signal due to support motion is substantially zero.

4,131,875

METHOD AND APPARATUS FOR ACOUSTIC LOGGING OF A BOREHOLE

John D. Ingram, Meudon, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,348
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—15.5 BH **45 Claims**



1. A method for generating separable early and late arrivals in a waveform representative of a sonic investigation of a borehole, comprising the steps of:

generating acoustic waves for travel to a receiver in a borehole at a preselected distance from a transmitter and forming measurable energies for the early and late arrivals, the frequencies of the generated waves being selected to preferentially enhance, relative to early arrivals, those late arrivals whose wave lengths are substantially larger than the diameter of a borehole;

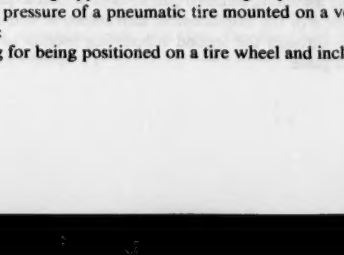
producing waveforms from the receiver wherein the waveforms include frequency-separable early arrivals and late arrivals wherein the late arrivals have wavelengths substantially larger than the diameter of the borehole.

4,131,876

PNEUMATIC TIRE PRESSURE MONITOR

Barry N. Dees, Sr., and Barry N. Dees, Jr., both of Rte. 2, Box 321D, Midlothian, Tex. 76065

Filed May 9, 1977, Ser. No. 795,322
Int. Cl.[2] B60C *23/04*
U.S. Cl. 340—58 **31 Claims**



1. A monitoring apparatus for detecting a predetermined drop in the pressure of a pneumatic tire mounted on a vehicle comprising:

a housing for being positioned on a tire wheel and including

a first chamber for communicating with the interior pressure of the pneumatic tire,

visual signalling means mounted in said housing and movable between a retracted position and an extended position visible to the operator of the vehicle,

actuator means for releasably securing said signalling means within said housing member in said retracted position,

a second chamber formed in said housing for maintaining therein a predetermined reference level of fluid pressure,

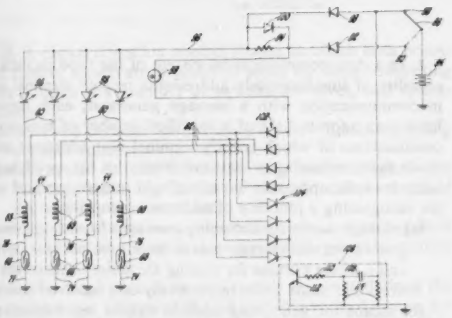
diaphragm means responsive to the pressure differentials between said first and second chambers, and

said actuator means responsive to said diaphragm means for releasing said visual signalling means for movement to said extended position to signal a predetermined drop in pressure within the pneumatic tire.

4,131,877
LOW TIRE PRESSURE INDICATOR CIRCUIT

John A. Stewart, Flint, and Wayne C. Nichols, Corunna, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 24, 1977, Ser. No. 809,789
Int. Cl.² B60C *23/02*
U.S. Cl. 340—58 **3 Claims**



1. In a low tire pressure indication system having magnet means for providing a magnetic field when low tire pressure occurs and an indicator circuit having a reed switch responsive to the magnetic field which causes the closure of the reed switch during a low tire pressure condition, the indicator circuit comprising

a power supply,

a coil and an indicator device serially connected with the reed switch and the power supply whereby the indicator device and coil are energized when the reed switch is closed, the magnetic flux of the coil being coupled to the reed switch to close the reed switch if it is open and latch the reed switch closed when the coil is energized,

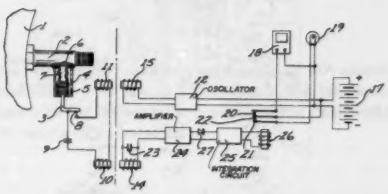
a control switch connected to said power supply having a first and a second position which in the first position closes the indicator circuit to furnish power to actuate the indicator device when the reed switch is closed in response to the magnetic field when low tire pressure occurs and which in the second position furnishes electrical power to the indicator circuit during circuit testing,

and a pulse developing circuit responsive to movement of the control switch to its said second position including means connected in series with said coil and in shunt with said reed switch for momentarily energizing the coil for a time period sufficiently long to close the reed switch whereby the reed switch is latched closed to energize and thereby test the indicator circuit so long as the control switch is in said second position, the movement of said control switch from said second to said first position being operative to interrupt the supply of power to said coil for a time period sufficient to permit unlatching of said reed switch whereby said system is set to provide low tire pressure indication.

4,131,878
DETECTOR FOR A PNEUMATIC TIRE

Sumi Yasuo, 12-4, 2-chome, Ebisu Minami, Shibuyaku, Tokyo, Japan

Continuation of Ser. No. 314,702, Dec. 13, 1972. This application May 11, 1976, Ser. No. 685,483
Int. Cl.² B60C *23/02*
U.S. Cl. 340—58 **7 Claims**



1. An information detector for detecting a parameter of a vehicle wheel comprising:

an electric circuit including an electromagnetic coupling, a first element of which is mounted for rotation with a wheel of a vehicle and a second element of which is fixed;

said first element comprising a first pair of coils interconnected with one another and said second element comprising a second pair of coils;

said first and second pairs of coils being arranged to come into opposing relationship at least once during a revolution of the wheel to provide electromagnetic coupling therebetween;

an oscillator arranged to supply a continuous oscillating signal of substantially fixed frequency to one of said second pair of coils;

a sensing element arranged to sense a parameter of the wheel connected between the coils and said first pair to control the current flowing between said coils in accordance with said parameter; and,

indicating means responsive to signals induced in the other of said second pair of coils to provide an indication of changes in said parameter,

said oscillating signal provided by said oscillator to said one of said second pair of coils remaining continuous with changes in said parameter.

4,131,879
METHOD AND APPARATUS FOR DETERMINING THE RELATIVE POSITIONS OF CORRESPONDING POINTS OR ZONES OF A SAMPLE AND AN ORGINAL

Kurt Ehrat, Steinmaur, Switzerland, assignor to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Apr. 25, 1977, Ser. No. 790,606
Claims priority, application Switzerland, Apr. 30, 1976, 5449/76
Int. Cl.² G06K *9/04*
U.S. Cl. 340—146.3 H **30 Claims**

1. A method of determining the relative positions of corresponding image points of a two-dimensional original and a two-dimensional sample comprising the steps of:

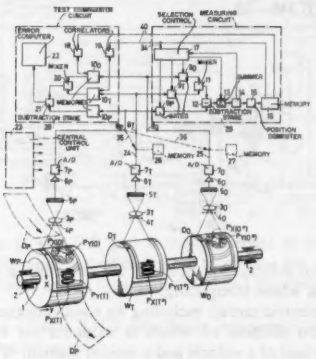
electronically pointwise scanning the original in accordance with a raster which is stationary with respect to the original;

selecting a plurality of individual positioning zones equally from the original and the sample so that corresponding zones of the original and the sample consist of corresponding image points and said zones are comparatively small with respect to the total area of the original and the sample;

fixing the sample with respect to a further scanning raster which has the same geometrical properties as said stationary scanning raster;

electronically pointwise scanning the sample;

electronically processing the scanning data obtained from scanning the original and the sample so as to obtain first position data indicative of the relative position of said individual positioning zones of said sample pattern each with respect to an individual raster zone of said further scanning raster, each individual raster zone being defined



by the raster points corresponding to those raster points of the respective individual positioning zone of the original; and

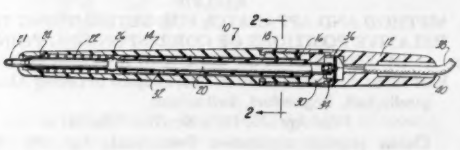
interpolating and extrapolating the first position data so as to obtain second position data which is indicative of the relative position of the image points of the sample each with respect to an individual raster point of said further scanning raster, said individual raster points corresponding to those raster points of the stationary scanning raster which coincide with the respective image points of the original.

4,131,880

SIGNATURE VERIFICATION PEN

Pepe Siy, Dearborn Heights, and Joseph R. Brown, Riverview, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 26, 1977, Ser. No. 845,642
Int. Cl.[2] G06K 9/00
U.S. Cl. 340—146.3 SY **10 Claims**



1. A pressure-sensitive signature verification device for use in a personal identification system wherein handwriting pressure is used as an identifying discriminant, the device comprising:

a stylus housing defined by a hollow, substantially cylindrical body having a longitudinal axis;

a stylus cartridge disposed within the stylus housing along the longitudinal axis thereof, the stylus cartridge terminating at one end in a writing tip adapted for contact with a writing surface, and terminating at another end in a bearing surface for transmitting reactive forces caused by the contact of the writing tip with the writing surface;

capacitive transducer means, mounted in contiguous relation with the bearing surface of the stylus cartridge and responsive to pressure pertubations of the bearing surface thereagainst, for providing an output signal related to the time rate of change of the pressure pertubations; and

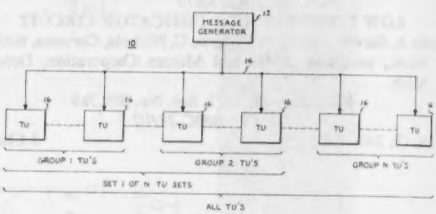
integrator circuit means, responsive to the output signal of the capacitive transducer means, for providing an output signal directly related to the pressure pertubations of the stylus cartridge against the capacitive transducer means.

4,131,881

COMMUNICATION SYSTEM INCLUDING ADDRESSING APPARATUS FOR USE IN REMOTELY CONTROLLABLE DEVICES

Paul B. Robinson, Durham, N.H.

Filed Sep. 12, 1977, Ser. No. 832,795
Int. Cl.[2] H04Q 9/00
U.S. Cl. 340—167 R **16 Claims**



1. In a data communication system of the type including a plurality of simultaneously addressable remote terminal units in communication with a message generator, each message having an address field of a specified number of binary bits, combinations of which specify terminal unit addresses and a mode field containing at least one binary bit for specifying an address mode, apparatus in each of said remote terminal units for recognizing a plurality of addresses comprising:

(a) storage means for receiving messages from said message generator, said storage means having an address portion and a mode portion for storing the binary bits of the address and mode fields respectively of a received message;

(b) means for generating address signals representative of addresses assigned to the individual remote terminal units, the number of assignable addresses corresponding in number to at least the maximum number specifiable by the address field bits of said messages;

(c) comparator means in communication with the address portion of said storage means and said means for generating address signals, said comparator means selectively generating at least first and second output selection signals when a comparison exists between the contents of the address portion and an assigned address specified by said address signals; and

(d) gating means responsive to specified binary bits of the address field and the mode field bit from said storage means and to said at least first and second output selection signals from said comparator means, said gating means selectively generating a terminal unit address enable signal for use by the respective terminal units in response to,

(i) a first message received by said storage means to simultaneously address all terminal units in accordance with a predetermined combination of the specified binary bits of the address field when the mode field bit is in a first binary state,

(ii) a second message received by said storage means to simultaneously address a first number of terminal units in accordance with a first output selection signal from said comparator means when the mode field bit is in said first binary state,

(iii) a third message received by said storage means to address a second number of terminal units in response to said predetermined combination of said specified binary bits of the address field and a second output selection

signal from said comparator means when the mode field bit is in a second binary state, and

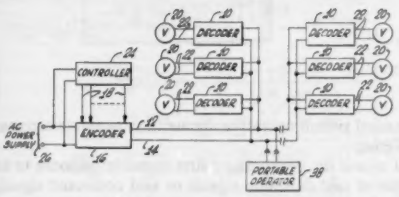
(iv) a fourth message received by said storage means to address a single terminal unit in response to the first and second output selection signals from said comparator means when the mode field bit is in said second state.

4,131,882

DIGITAL TWO-WIRE IRRIGATION CONTROL SYSTEM WITH FEEDBACK

Michael D. Hollabaugh, San Jose, and Vinod Panday, Pomona, both of Calif., assignors to Clemar Manufacturing Corporation, Glendora, Calif.

Filed Dec. 29, 1975, Ser. No. 644,535
Int. Cl.[2] H04B *3/00*
U.S. Cl. 340—310 A **35 Claims**



24. A digital irrigation control system in which both power and control signals are transmitted along the same conducting lines to control a plurality of switchable valves, said system comprising:

at least one decoder for decoding control signals, including decoder addresses and on/off codes;

means at said decoder for transmitting feedback signals of a first type indicating that an on/off code addressed to said decoder has been received;

portable control means connectable to the conducting lines to control the switchable valves, said portable control means including

means responsive to control signals transmitted along the lines and addressed to said portable control means, for transmitting feedback signals of the first type, indicating that said portable control means is connected to the lines,

manually operable means for selecting decoder control functions, and

means for transmitting feedback signals of a second type, to convey the selected decoder control functions; and an encoder including

means for detecting and storing feedback signals of said first and second types,

means for selecting for transmission on/off codes from a predetermined sequence of commands, if said portable control means is not connected to the lines,

means for selecting for transmission on/off codes determined by said feedback signals of the second type, if said portable control means is connected to the lines, and

means for encoding the selected on/off codes and decoder addresses onto the lines for transmission to said decoder and said portable control means.

4,131,883

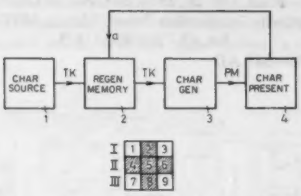
CHARACTER GENERATOR

Jan-Erik Lundstrom, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Jan. 13, 1977, Ser. No. 759,208
Claims priority, application Sweden, Jan. 20, 1976, 7600544
Int. Cl.[2] G06K *15/20*
U.S. Cl. 340—324 AD **5 Claims**

1. A character generator for receiving input character data and generating corresponding characters of variable size and shape in the form of dot matrices on a raster scan display, comprising:

a character memory for storing information defining a characteristic dot matrix for each distinguishable character,



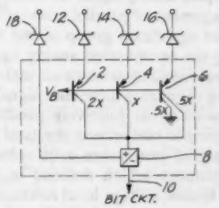
said information including a plurality of dot matrix data fields, each field having a plurality of link bits associated therewith for defining the position of the field within the dot matrix of a character.

4,131,884

TRIMMING CONTROL CIRCUIT FOR A DIGITAL TO ANALOG CONVERTER

Donald T. Comer, Los Gatos, Calif., assignor to Precision Monolithics, Inc., Santa Clara, Calif.

Filed Feb. 14, 1977, Ser. No. 768,327
Int. Cl.[2] H03K *13/02*
U.S. Cl. 340—347 CC **17 Claims**



1. In a digital to analog converter having a plurality of bit circuits, and a corresponding plurality of leads for transmitting input digital voltage signals below a predetermined threshold level to said bit circuits, at least some of said bit circuits each having an associated plurality of selectable trimming elements, wherein the improvement comprises:

a two-terminal actuating means for each of said elements, each actuating means being operable in response to a pair of gating voltage signals in excess of said threshold level applied to its terminals, and

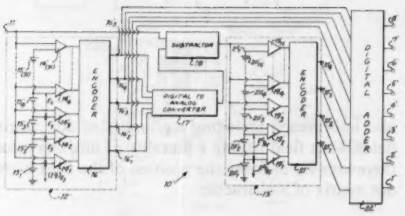
means connecting the terminals of each actuating means in circuit respectively with a unique pair of leads, said leads providing gating signal paths enabling the selection of a trim signal for each bit circuit by applying gating signals to those lead pairs which are connected to the actuating means for the desired combination of elements, said bit circuits being capable of withstanding gating voltages applied at their respective leads, and

a positive voltage bus connected in circuit with each of said actuating means to supply an actuating signal to said trimming elements when said actuating means are operated, said bus also being connected to supply an operating voltage to said bit circuit.

4,131,885
PARALLEL-SERIAL ANALOG TO DIGITAL CONVERTERS

Takeshi Ninomiya, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 29, 1976, Ser. No. 681,507
Claims priority, application Japan, May 1, 1975, 50-52030
Int. Cl.[2] H03K *13/175*
U.S. Cl. 340—347 AD 14 Claims



1. An analog to digital converter comprising: a plurality of parallel conversion units in a serial arrangement comprising a preceding parallel conversion unit and a following parallel conversion unit for specifying respective groups of decreasingly significant bits of a digital character, each of said parallel conversion units including a number of comparators having first inputs for receiving an analog signal and second inputs for receiving respective voltage level reference signals, and encoder means receiving the outputs of said comparators for providing an encoded output specifying the most significant group of bits of a digital character corresponding to the analog signal received by said first inputs of the respective comparators; an input terminal for receiving a sampled analog input signal said input terminal being connected to said first inputs of the comparators in said preceding parallel conversion unit to supply said sampled analog signal thereto; means interposed in said serial arrangement of parallel conversion units for reconverting the most significant group of bits to an analog signal and subtracting the reconverted analog signal from said sampled analog input signal to produce an analog difference signal and for applying the analog difference signal to said first inputs of the comparators in the following parallel conversion unit; means for applying to said second inputs of the comparators in each of said parallel conversion units voltage level reference signals of magnitudes which descend in respective voltage steps, with the lowest voltage level reference signal applied to the lowest level comparator of the preceding parallel conversion unit being substantially different from the remaining voltage level reference signals for each of the other comparators in the preceding parallel conversion unit and the range of the voltage level reference signals for said following parallel conversion unit being larger than, and offset in respect to, said steps of the voltage level reference signals for said preceding parallel conversion unit; and digital adding means adding the encoded outputs of all of said parallel conversion units with the least significant bit of the encoded output from said preceding parallel conversion unit and the most significant bit of the encoded output from said following parallel conversion unit being accorded the same weight.

4,131,886
INDICATION SYSTEM

Shuichi Kosuge, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

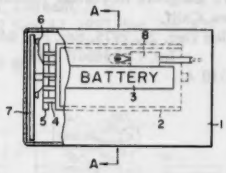
Filed Mar. 16, 1977, Ser. No. 778,171
Claims priority, application Japan, Mar. 25, 1976, 51/32947; Apr. 9, 1976, 51/40654
Int. Cl.[2] G08B *19/00*
U.S. Cl. 340—378 R 11 Claims

1. An indication system comprising:

a plurality of on-off switches for respectively generating detection signals indicative of abnormal conditions in response to either on or off conditions thereof;

a rotary switch having a movable contact and a plurality of stationary contacts being respectively connected to said on-off switches to be supplied with said detection signals;

an indication drum coupled to said switch for causing said movable contact to slide over said stationary contacts during the rotation thereof, said indication drum being recorded with a plurality of marks thereon corresponding to respective abnormal conditions detected by said on-off switches;



a manual switch operative manually to generate a command signal;

first means for generating a first signal in response to either one of said detection signals or said command signal;

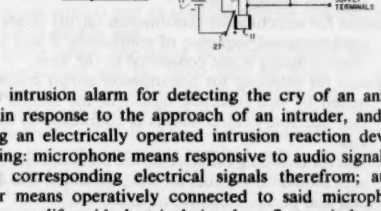
second means for generating a second signal in response to the contact of said movable contact with one of said stationary contacts supplied with corresponding one of said detection signals; and

actuating means for rotating said indication drum in response to said first signal applied from said first means and stopping said indication drum in response to said second signal applied from said second means.

4,131,887
INTRUSION ALARM SYSTEM UTILIZING THE BARKING OF A WATCHDOG

Warren D. Birkenhead, 59-529 Hoalike Rd., Haleiwa, Hi. 96712

Filed Feb. 14, 1977, Ser. No. 768,271
Claims priority, application Japan, Aug. 19, 1976, 51-99191
Int. Cl.[2] G08B *13/00*
U.S. Cl. 340—566 5 Claims



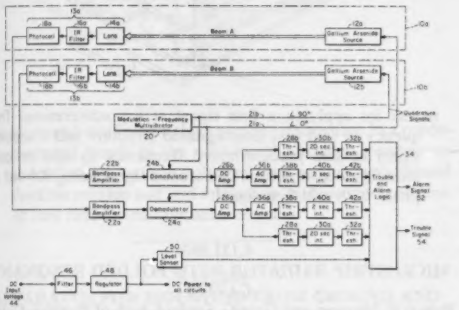
1. An intrusion alarm for detecting the cry of an animal uttered in response to the approach of an intruder, and for actuating an electrically operated intrusion reaction device, comprising: microphone means responsive to audio signals to produce corresponding electrical signals therefrom; audio amplifier means operatively connected to said microphone means to amplify said electrical signals; a first switch means operatively connected to said audio amplifier means and being normally open but closing in response to receipt of said electrical signals; an electrically operated intrusion reaction device; delay means to cause said intrusion reaction device to operate for a selected period of time after said first swithc means has closed, comprising second and third switch means; said second switch means being normally closed and said third switch means being normally open, said third switch means responding to the closing of said first switch means by itself closing to complete an energizing circuit for said intrusion reaction device and to initiate a delay of said selected period of time

provided by said delay means, said second switch means being operative to open at the end of said selected period of time to again open said third switch means and, hence, break said energizing circuit for said intrusion reaction device.

4,131,888
DUAL PROJECTED-BEAM SMOKE DETECTOR

Aaron A. Galvin, Lexington, Mass., assignor to American District Telegraph Company, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,405
Int. Cl.[2] G08B 17/10
U.S. Cl. 340—630 **13 Claims**



1. Apparatus for detecting the presence of smoke, comprising:

first and second detector channels, each including:

means for transmitting a beam of radiation over a path;

means for receiving the transmitted beam of radiation; and

means for sensing a level of received radiation and for producing an intermediate signal representative thereof;

the paths of the beams of radiation in the first and second detector channels being substantially parallel; and

alarm means to which are applied the intermediate signals from the first and second detector channels for producing an alarm signal in response to values of the intermediate signals indicative of the concurrent presence of smoke in the paths of both the first and second channels;

the sensing means further including:

first threshold means for determining when the level of the received radiation has decreased by a first percentage for a first predetermined duration and for producing an output signal indicative thereof; and

second threshold means for determining when the level of the received radiation has decreased by a second percentage, larger than said first percentage, for a second predetermined duration, longer than said first predetermined duration, and for producing an output signal indicative thereof;

the alarm means further including:

means for providing an alarm signal in response to the presence of an output signal from the first threshold means of both first and second channels;

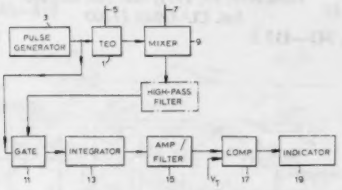
means for producing a trouble signal in response to the occurrence of an output signal from the second threshold means of either channel.

4,131,889
MINIATURE DOPPLER RADAR SYSTEMS AND MICROWAVE RECEIVERS SUITABLE THEREFOR

Kenneth W. Gray, Malvern, England, assignor to National Research Development Corporation, London, England

Filed Feb. 8, 1977, Ser. No. 766,789
Int. Cl.[2] G01S 9/44
U.S. Cl. 343—8 **7 Claims**

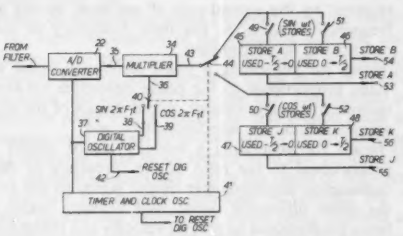
1. A doppler radar system comprising a solid state microwave source, pulsing means for repetitively pulsing the source on and off, a transmit antenna for transmitting the microwave signal generated by the source, a receive antenna for receiving reflections for a moving object of signals transmitted from the transmit antenna, said source generating a reference signal consisting of pulses of microwave radiation coinciding with at least a proportion of the received signal pulses, a mixer connected to said source via a leakage path for mixing the received and reference signals to produce a pulsed electrical output, an electrical pulse means for providing a doppler signal output from the successive amplitude values of a pulsed input signal, a gate for applying when open the output of the mixer to the providing means, and means for opening the gate in a pulsed manner in coincidence with the mixer output pulses.



4,131,890
SPECTRAL ANALYSIS

John D. Outram, Titchfield, England, assignor to Plessey Handel und Investments AG, Zug, Switzerland

Filed Apr. 7, 1977, Ser. No. 785,695
Claims priority, application United Kingdom, Apr. 8, 1976, 14268/76
Int. Cl.[2] G01R 23/02
U.S. Cl. 343—108 M **6 Claims**



1. A method of frequency identification comprising mixing an unknown frequency signal with first and second quadrature related functions of a known frequency signal alternately for a predetermined period, storing a plurality of samples taken over the whole of the period of the product of the unknown frequency signal and the first function of the known frequency signal, storing a plurality of samples taken over the whole of the period of the product of the unknown frequency signal and the second function of the known signal and processing the samples to solve the equation:

$$G(f_1) = \frac{aT}{2}\left(\frac{e^{j(\theta-\frac{\pi}{2})}\,\mathrm{Sin}\,\pi T(fo-f1)}{\pi T(fo-f1)} + \frac{e^{-j(\theta-\frac{\pi}{2})}\,\mathrm{Sin}\,\pi T(fo+f1)}{\pi T(fo+f1)}\right)$$

where fo is the frequency unknown signal, f1 is the frequency

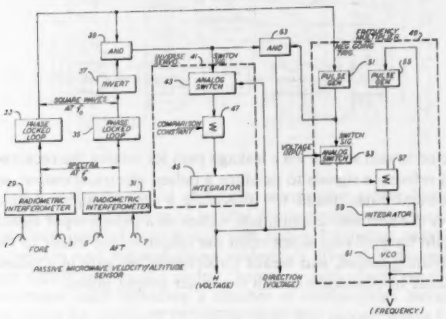
of the known signal, T is the said predetermined period and a is the amplitude of fo at T/2.

4,131,891

PASSIVE MICROWAVE VELOCITY SENSOR

Gus Stavis, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Nov. 17, 1977, Ser. No. 852,405
Int. Cl.[2] G01S *11/00*
U.S. Cl. 343—112 S **13 Claims**



7. A passive microwave velocity sensor for determining ground velocity by using the natural radiation from terrain received by first and second pairs of receiving antennas spaced apart along the direction in which velocity is to be sensed and with the same separation between antennas in both pairs, comprising:

a) a first radiometric interferometer having a filter frequency for processing signals received by the first pair of antennas;

b) a second radiometric interferometer for processing signals received by the second pair of antennas, having a filter frequency identical to the filter frequency of the first radiometric interferometer;

c) means for generating a phase difference signal with a value proportional to the phase difference between the radiometric interferometer output signals of the first and second radiometric interferometers; and

d) means for generating a velocity sensor output signal proportional to the ratio of the frequency of the first radiometric interferometer output signal to the value of the phase difference signal, said velocity output signal being proportional to ground velocity and independent of altitude.

4,131,892

STACKED ANTENNA STRUCTURE FOR RADIATION OF ORTHOGONALLY POLARIZED SIGNALS

Robert E. Munson; Gary G. Sanford, both of Boulder, and Lawrence R. Murphy, Longmont, all of Colo., assignors to Ball Corporation, Muncie, Ind.

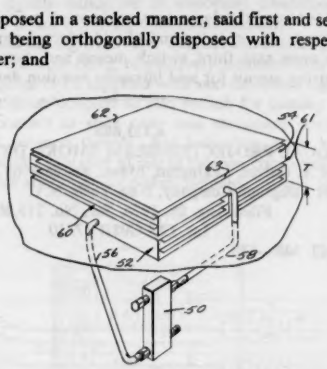
Filed Apr. 1, 1977, Ser. No. 783,542
Int. Cl.[2] H01Q *13/10, 1/42, 00/00*
U.S. Cl. 343—700 MS **21 Claims**

13. An antenna structure for radiating two orthogonally polarized signals comprising:

a first interdigitated structure, including first and second sets of interdigitated conductive sheets defining a first resonant cavity therebetween having a least a first radiating aperture;

a second interdigitated structure, including third and fourth sets of interdigitated conductive sheets defining a second resonant cavity therebetween, having at least a second radiating aperture;

said first and second interdigitated structures being relatively disposed in a stacked manner, said first and second apertures being orthogonally disposed with respect to each other; and



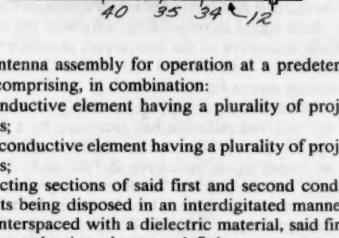
means for applying a first signal at a predetermined frequency to said first interdigitated structure and a second signal at said predetermined frequency to said second interdigitated structure, said second signal being 90° out of phase with said first signal.

4,131,893

MICROSTRIP RADIATOR WITH FOLDED RESONANT CAVITY

Robert E. Munson, and Gary G. Sanford, both of Boulder, Colo., assignors to Ball Corporation, Muncie, Ind.

Filed Apr. 1, 1977, Ser. No. 783,541
Int. Cl.[2] H01Q *1/38, 1/48*
U.S. Cl. 343—700 MS **37 Claims**



17. An antenna assembly for operation at a predetermined frequency comprising, in combination:

a first conductive element having a plurality of projecting sections;

a second conductive element having a plurality of projecting sections;

the projecting sections of said first and second conducting elements being disposed in an interdigitated manner, and being interspaced with a dielectric material, said first and second conductive elements defining a resonant cavity between the projecting sections thereof such that said resonant cavity is of a length no longer than approximately one wavelength of a signal at said predetermined frequency in said dielectric material and equal to approximately a predetermined multiple of one-quarter of a wavelength of said signal of said predetermined frequency in said dielectric material.

4,131,894

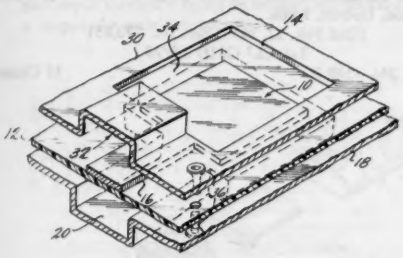
HIGH EFFICIENCY MICROSTRIP ANTENNA STRUCTURE

Frank J. Schiavone, Longmont, Colo., assignor to Ball Corporation, Muncie, Ind.

Filed Apr. 15, 1977, Ser. No. 788,603
Int. Cl.[2] H01Q *1/38, 1/42;* H01P *3/00*
U.S. Cl. 343—700 MS **16 Claims**

1. In an apparatus for radiating microwave frequency signals of the type including a first conductive sheet element of predetermined planar configuration, said first conductive sheet ele-

ment including a feedline portion and a microstrip antenna patch portion and a second conductive sheet element, said first conductive sheet element overlying said second conductive sheet element, and being separated therefrom by a dielectric substance, the improvement wherein:



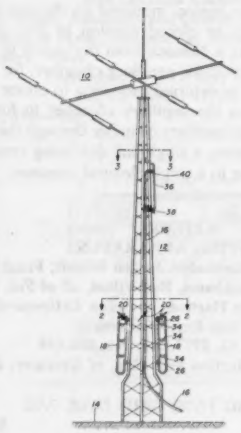
said second conductive sheet element is indented to a predetermined depth in the vicinity of said first conductive sheet element, to form a channel void underlying both said feedline portion and said microstrip antenna patch portion of said first conductive sheet element.

4,131,895

APPARATUS FOR ISOLATING FROM GROUND AND EXCITING A CONDUCTIVE TOWER FOR USE AS A VERTICAL ANTENNA

Ralph O. Robinson, 10206 Julep Ct., Silver Spring, Md. 20902

Filed Sep. 14, 1976, Ser. No. 723,110
Int. Cl.[2] H01Q *9/34*
U.S. Cl. 343—792 **11 Claims**



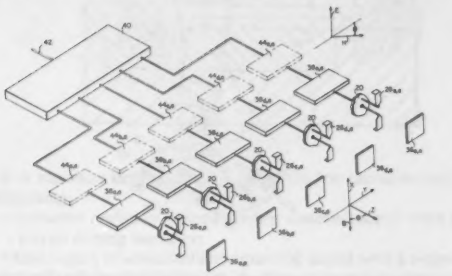
1. An antenna in the form of an elongated conductive supporting tower one end of which effectively joins to ground, said tower having isolator means including at least one tunable electrically shortened quarter wave length parallel transmission line section attached to at least one portion of the tower for providing a high impedance at said portion to current at the resonant frequancy thereof, the tower further having exciter means having at least one tunable electrically shortened quarter wavelength parallel transmission line section attached to at least a second portion of the tower for exciting said second portion to cause radiation or reception at a selected frequency, said isolator means and said exciter means both being substantially coincident with and parallel to said antenna.

4,131,896

DIPOLE PHASED ARRAY WITH CAPACITANCE PLATE ELEMENTS TO COMPENSATE FOR IMPEDANCE VARIATIONS OVER THE SCAN ANGLE

Coleman J. Miller, Twin Harbors, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 656,913, Feb. 10, 1976, abandoned. This application Aug. 10, 1977, Ser. No. 823,484
Int. Cl.[2] H01Q *3/26, 19/00*
U.S. Cl. 343—815 **13 Claims**



1. For use in a phase array of dipole-type radiating elements that provide a directive antenna beam electronically scanned in the H-plane over a wide angle, the combination comprising:

conductive means forming a ground plane;

a plurality of dipole-type radiating elements disposed on the beam projecting side of said ground plane and aligned along a linear array axis, each of said dipole-type radiating elements including a pair of opposed half-dipole members which divaricate from a feed point, said feed point being spaced from said ground plane by a distance substantially within the range one-eighth to one-fourth the nominal operating wavelength for the array, each of said dipole-type radiating elements having an effective dipole axis perpendicular to said linear array axis and parallel to said ground plane; and

a plurality of capacitance plates for minimizing the variation in the input impedance of the radiating elements under wide angle H-plane electrical scanning of the radiating elements, said capacitance plates being made of conductive metal and supported by a low R.F. loss material in a reference plane that is parallel to said ground plane and disposed on said beam projecting side of the ground plane, said reference plane being spaced from said ground plane by a distance substantially within the range of one-fourth to one-half the nominal operating wavelength for the array, each of said capacitance plates being disposed in a predetermined pattern with at least some of the capacitance plates being nonaligned with the feed points of the dipole-type radiating elements in a direction perpendicular to the ground plane such that the plurality of capacitance plates are symmetrically located with respect to said feed points and with respect to the effective dipole axis of the dipole-type radiating elements, and having a predetermined shape of finite size which is less than one-fourth the nominal operating wavelength for the array in either its dimension parallel to or its dimension perpendicular to the linear array axis.

4,131,897

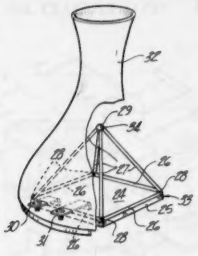
TV ANTENNA

Charles J. Gaunt, 15742 Rushmore, Taylor, Mich. 48180

Continuation of Ser. No. 724,329, Sep. 17, 1976, abandoned. This application Mar. 16, 1978, Ser. No. 887,432
Int. Cl.[2] H01Q *1/30*
U.S. Cl. 343—908 **5 Claims**

1. An antenna for use in conjunction with and in the immediate proximity of small portable broad band radio wave receivers such as radios and televisions, comprising:

a plurality of conductive elongated members of equal length;
means defining a planar conductive base, said base being composed of an insulative portion and a conductive portion, said insulative portion having a planar surface which is at least in part overlayed by said conductive portion, one end of each of said members being affixed to the conductive portion of said base at spaced points thereon proximate the perimeter thereof to define an enclosed area



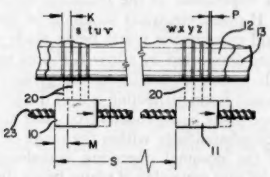
interior of said members, the other ends of the elongated members converging and being affixed at and forming the apex of an enclosed equilateral rectangular pyramid shaped area;
and first and second terminal means for electrically connecting the antenna to a receiver, said first and second terminal means affixed to said conductive portion and insulative portion respectively of said base.

4,131,898

INTERLACING RECORDER

Rodger L. Gamblin, Oakwood, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed Sep. 15, 1977, Ser. No. 833,579
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—75 **4 Claims**



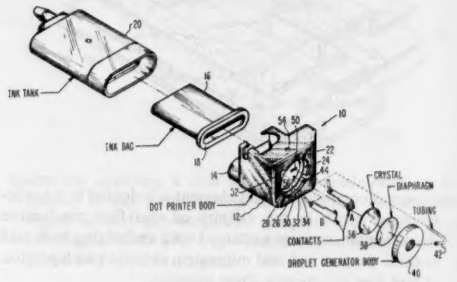
1. In an ink jet printer apparatus comprising rotary support means, mounting means for mounting a print receiving sheet upon said support means, a plurality of jet drop print heads positioned for directing printing jets toward said sheet, first drive means for rotating said support means about an axis of rotation, second drive means for driving said print heads axially at a common speed and causing said print heads to cover said sheet with printed tracks collectively defining contiguous printed bands; the improvement wherein each of said print heads produces a plurality of jets which are spaced apart by a distance equal to a number of track widths having no factor other than one as a common factor with the number of jets produced by one of said heads and further wherein said print heads are arranged along a common line parallel to said axis of rotation with a spacing between common points of said heads equal to an integral number of advance distances for interlacing of the edges of the printed bands produced by the different heads and during one revolution of said rotary support means advance axially as aforesaid an advance distance equal to a track width multiplied by the total number of jets and divided by the number of print heads.

4,131,899

DROPLET GENERATOR FOR AN INK JET PRINTER

Kyriakos Christou, Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 22, 1977, Ser. No. 770,851
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—140 R **13 Claims**



1. An ink jet droplet generator comprising:
a generator body having a front face and a rear face, the rear face having formed within it a central recess of substantially uniform depth to define a capillary chamber;
a nozzle defined by a plurality of continuous aperatures communicating the front face and the capillary chamber of the generator body;
feed means, in fluid communication with the capillary chamber, for feeding ink to the capillary chamber from an ink source; and
a single planar flexure means, mounted on the rear face of the generator body in closed relation to the capillary chamber and having a distance from the nozzle to permit capillary action within the capillary chamber, for flexurally responding to an external excitation to create a pressure perturbation in the capillary chamber to force the flow of ink from the capillary chamber through the nozzle for droplet generation, a single ink dot being created on demand in response to a single flexural response.

4,131,900

PRINTING APPARATUS

Hans Joachim Erb, Gotzenhaim; Jurgen Brandt, Frankfurt am Main, and Peter Kirschbaum, Bad Vilbel, all of Fed. Rep. of Germany, assignors to Hartman & Braun Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

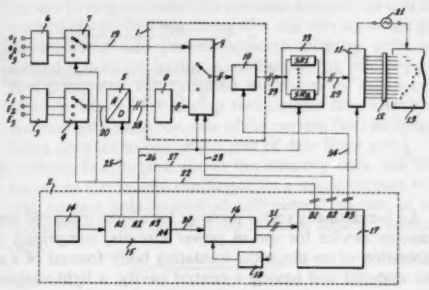
Filed Jun. 13, 1977, Ser. No. 805,648
Claims priority, application Fed. Rep. of Germany, Jun. 15, 1976, 2626682
Int. Cl.[2] G03G *17/00*; G01D *15/08, 7/02*
U.S. Cl. 346—162 **8 Claims**

1. Recording device for recording a plurality of different input signals provided in a corresponding plurality of different channels, comprising a multiplexing means for sequentially scanning said input channels to obtain a cyclically repeated acquisition of said input signals;
an analog-to-digital conversion means having its input connected to an output of the multiplexing means for association with all of the channels of the plurality which provide analog signals, to obtain digitization thereof and to provide a train of digital signals;
means for providing signals representing fixed numbers, defining individual zero scale levels for recording the digitized input signals;
an adder connected for receiving the digital signals from the

multiplexing means and as digitized and said fixed numbers to obtain an added output;

means connected to multiplexing means and the means for providing, to operate them in synchronism with each other;

a one-out-of-n decoder connected to the adder for receiving the output thereof, n being an integer, the decoder having n output channels accordingly;



a plurality of altogether n- recording means respectively connected to the n output channels of the decoder for being individually operated by the decoder output channels; and

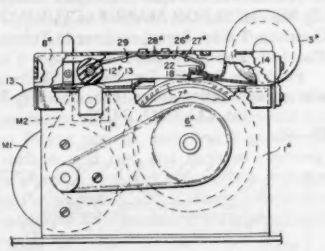
a recording medium moving relative to the recording means to obtain print dots upon operation of the respective recording means.

4,131,901

COVER MOUNTED HOLDDOWN FOR FACSIMILE RECORDER CASSETTE

John M. Alden, Needham, and George C. Williams, South Easton, both of Mass., assignors to Alden Research Foundation, Westboro, Mass.

Filed Mar. 9, 1977, Ser. No. 775,891
Int. Cl.[2] G03G *17/00, 17/02*
U.S. Cl. 346—165 **13 Claims**



1. A graphic recorder of electrical signals on a moving recording web drawn on a path from a detachable cassette past a linear recording electrode disposed on the cassette comprising:

a frame detachably receiving the cassette with its linear electrode adjacent a recording zone transverse of the web path,

scanning electrode means on the frame cooperative with the linear electrode to apply electrical marking signals to the web, and

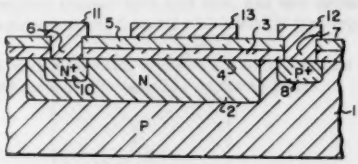
means attached moveably to the frame carrying a resilient member for engaging the cassette and yieldingly urging the linear electrode toward the web path to insure contact of the linear electrode across the web.

4,131,902

BIPOLAR TRANSISTOR WITH A DUAL-DIELECTRIC TUNNEL EMITTER

Francis J. Kub, Pasadena, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1977, Ser. No. 838,261
Int. Cl.[2] H01L *49/02*
U.S. Cl. 357—6 **30 Claims**



1. A transistor device having a dual-dielectric tunnel emitter, comprising:

a collector region of semiconductor material doped with a p-type doping impurity;

a base region of semiconductor material doped with a n-type doping impurity and disposed adjacent to and in physical contact with the collector region to form a n-p, base-collector junction;

a first layer of dielectric material of a predetermined thickness having one surface disposed adjacent to and in physical contact with said base region to form a dielectric-semiconductor interface;

a second layer of dielectric material of a predetermined thickness having one surface disposed adjacent to and in physical contact with the other surface of said first dielectric layer, said first dielectric layer being sandwiched between said base region and said second dielectric layer to form a dual-dielectric emitter-base junction;

means for applying a voltage potential between the other surface of said second dielectric layer and said base region to cause injection of minority carriers across the dielectric-semiconductor interface and into the base region, said minority carrier injection occurring at times when a positive potential of sufficient magnitude is applied to said other dielectric surface of the second layer with respect to said n-type doped base region; and

means for applying a voltage potential across the n-p, base-collector junction to transport said injected minority carriers across said n-p, base-collector junction, said base minority carrier transport mechanism occurring when a negative potential of sufficient magnitude is applied to said collector region with respect to said base region.

4,131,903

CAPACITOR DIELECTRIC WITH INNER BLOCKING LAYERS AND METHOD FOR PRODUCING THE SAME

Helmut Schmelz, Prien, and Werner Schwaen, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jul. 14, 1977, Ser. No. 815,579
Int. Cl.[2] H01D *29/12*
U.S. Cl. 357—10 **3 Claims**

1. A capacitor dielectric with inner blocking layers, comprising:

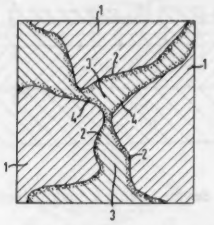
(a) a polycrystalline ceramic body made of a material with a perovskite structure on the basis of barium titanate having the general formula

$$(Ba_{1-x}M_x^{II})O \cdot z(Ti_{1-y}M_y^{IV})O_2$$

with M^{II} selected from the group Ca, Sr, Pb and Mg and M^{IV} = Zr, Sn, with z assuming the values 1.005 to 1.05;

(b) said dielectric containing at least two different doping substances of which one selected from the group anti-

mony, niobium, lanthanum and bismuth is inside crystallites of the crystalline body and causes predominantly n-type conduction, and the other selected from the group copper, cobalt, nickel, iron and manganese in the surface layer of the crystallites causes predominantly p-type conduction, the proportion of the doping substance causing the n-type condution being 1.5 to 2.5 times greater than a maximum doping amount (maximum solid state solubility)



and the proportion of the substance causing the p-type conduction amounting to 0.01 to 0.15% by weight;

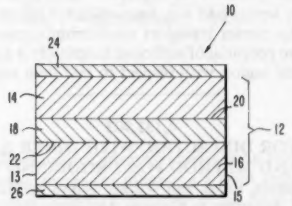
(c) a titanate intermediate phase disposed between grains of the crystallites which is rich in titanium dioxide and is at least partially recrystallized and contains the doping substance causing p-type conduction spread inhomogeneously such that this p-type doping substance is highly enriched towards the crystallite grain surfaces.

4,131,904

DEGRADATION RESISTANCE OF SEMICONDUCTOR ELECTROLUMINESCENT DEVICES

Ivan Ladany, Stockton, and Henry Kressel, Elizabeth, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Jun. 29, 1977, Ser. No. 811,289
Int. Cl.² H01L *33/00*
U.S. Cl. 357—17 **6 Claims**



1. An electroluminescent device having a body of semiconductor material of a group III-V compound or mixed group III-V compound comprising:

a first layer of P type conductivity at one surface of said body, said layer having zinc as a primary conductivity modifier and germanium as a secondary conductivity modifier of a concentration smaller than the concentration of the zinc primary conductivity modifier;

a second layer of N type conductivity at an opposite surface of said body; and

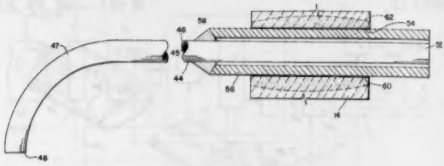
a third layer between and contiguous to said first and second layers being of a material which forms hetero-junctions with said first and second layers, and being the recombination region of the device.

4,131,905

LIGHT-TRIGGERED THYRISTOR AND PACKAGE THEREFORE

Maurice H. Hanes, Murrysville, and Lewis R. Lowry, Greensburg, both of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 26, 1977, Ser. No. 800,706
Int. Cl.² H01L *27/14, 31/00, 23/02*
U.S. Cl. 357—30 **12 Claims**



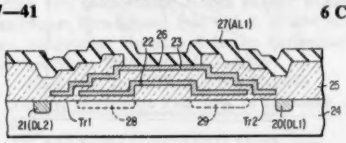
1. An hermetically sealed package for a light-triggered semiconductor device for use in power circuits, comprising the combination of an electrical insulating body formed of a ceramic material and having a central cavity, a light-triggered semiconductor device within the cavity, first and second pole pieces positioned within the opposite ends of the body and having respective inner pole faces juxtaposed with and electrically coupled in face-to-face relationahip to opposite sides of the semiconductor device for carrying substantial currents, means forming hermetical seals about the first and second pole pieces and respective ends of the body, means forming an opening in the body, a glass light pipe having an inner end optically coupled with a light-sensitive region of the semiconductor device and an outer end extending through the opening in the body, said outer end adapted to be optically coupled with a light source for triggering the device, a hollow metal sleeve mounted about a portion of the outer end of the light pipe, said sleeve also being mounted through the opening in the body, means for forming an hermetical seal between the light pipe and the sleeve, and means for forming an hermetical seal between the sleeve and the body.

4,131,906

DYNAMIC RANDOM ACCESS MEMORY USING MOS FETS AND METHOD FOR MANUFACTURING SAME

Hiroyuki Kinoshita, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kanagawa, Japan

Filed Feb. 2, 1977, Ser. No. 764,897
Claims priority, application Japan, Feb. 13, 1976, 51-14568
Int. Cl.² H01L *27/02*
U.S. Cl. 357—41 **6 Claims**



1. A dynamic Random Access Memory using MOS FETS comprising:

a semiconductor substrate of one conductivity type;

a pair of data lines each comprising an impurity diffusion layer of an opposite conductivity type and formed in the semiconductor substrate;

a pair of co-linear adjacent memory cells located between the data lines, each cell comprising a capacitor and a MOS FET formed adjacent to the capacitor for reading out and writing in information, said pair of memory cells comprising a first insulating film formed on said substrate, said first film having a pair of thin co-linear end portions separated by a thick portion; a first conductor formed on said

first insulating film, said first conductor having a pair of co-linear end portions lying on said thin portions of said first insulating film, each of said end portions of said first conductor serving as one electrode of a capacitor; a second insulating film formed on said first conductor, said second insulating film having a thin portion formed on said end portion of said first conductor; a second conductor formed on said first and second insulating films and bridging said insulated first conductor, said second conductor having co-linear end portions disposed on said thin portion of said first insulating film and serving as the gate electrodes of said pair of adjacent memory cells, said second conductor having a central portion bridging said first conductor and insulated therefrom by said second film; the MOS FET having two current flow electrodes and said gate electrode, one of the current flow electrodes being coupled to one of the pair of data lines; and

an address line formed above the memory cells and connected to the second conductor by a single contact hole, said contact hole located at said central portion of said second conductor between the co-linear adjacent memory cells.

4,131,907

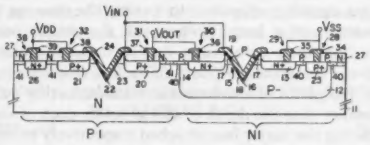
SHORT-CHANNEL V-GROOVE COMPLEMENTARY MOS DEVICE

Paul H. Ouyang, 936 Junesong Way, San Jose, Calif. 95133

Filed Sep. 28, 1977, Ser. No. 837,613

Int. Cl.[2] H01L *27/02*

U.S. Cl. 357—42 **11 Claims**



1. A complementary metal-oxide-semiconductor field effect device comprising:

a lightly N-doped semiconductor substrate having a first surface and a lightly P-doped tub therein;

a first P-type region lying beneath and extending to said first surface in said semiconductor substrate;

a second P-type region lying beneath and extending to said first surface in said semiconductor substrate;

a first V-groove extending from said first surface into said semiconductor substrate lying between said first and said second P-type regions, said first V-groove having two side surfaces and two end surfaces exposing said first P-type region with a first side surface and exposing said second P-type region with a second side surface;

a first relatively thin insulating layer overlying said first V-groove;

a first N-type layer lying beneath and extending to said first surface in said substrate surrounding said first P-type region, said second P-type region and said first V-groove;

a first N-type region lying beneath and extending to said first surface in said N-doped tub;

a second N-type region lying beneath and extending to said first surface in said N-doped tub;

a second V-groove extending from said first surface into said P-doped tub disposed between said first and said second N-type regions having two side surfaces and two end surfaces;

a first P-type layer lying beneath and adjacent to a portion of said first and said second N-type regions exposed by all four surfaces of said V-groove;

a second P-type layer lying beneath and extending to said first surface in said N-type tub surrounding said first and said second N-type regions and said second V-groove;

a second relatively thin insulating layer overlying said second V-groove;

a relatively thick insulating layer of substantially uniform thickness disposed over said first surface of said semiconductor substrate having openings therein over said first and said second P-type regions, and said first and said second N-type regions;

first, second, third, and fourth electrodes respectively making electrical contact with said first, and said second P-type regions and said first and said second N-type regions; and

fifth and sixth electrodes respectively overlying said first and said second relatively thin insulating layers.

4,131,908

SEMICONDUCTOR PROTECTION DEVICE HAVING A BIPOLAR LATERAL TRANSISTOR

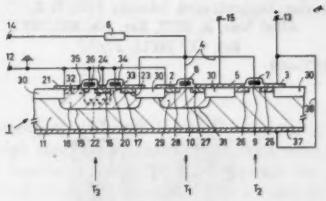
Dirk Daub, and Olof E. H. Klaver, both of Nijmegen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 10, 1977, Ser. No. 767,569

Claims priority, application Netherlands, Feb. 24, 1976, 7601843

Int. Cl.[2] H01L *27/02*

U.S. Cl. 357—42 **12 Claims**



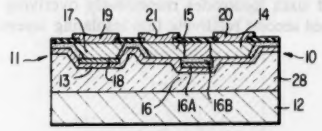
1. A semiconductor device having a semiconductor body with a surface-adjoining substrate region of a first conductivity type and comprising an integrated circuit having at least two supply electrodes, an input electrode and an output electrode, in which there is present between a first and a second of the electrodes a protection circuit having a bipolar lateral protection transistor which is formed by emitter and collector zones of said first conductivity type and a surface-adjoining base region of a second conductivity type formed in said substrate region, said emitter and collector zones adjoining a surface of the semiconductor body and being provided in and surrounded by said surface-adjoining base region, which base region comprises a base connection contact so that a resistor formed by a part of the base region is present in the current parth from said base connection contact to the active base zone situated between the emitter and collector zones; the emitter zone, the base connection contact, and said first electrode being connected together electrically and the collector zone being connected electrically to said second electrode, and the base region being surrounded substantially entirely within the semiconductor body by the surface-adjoining substrate region of the first conductivity type which forms a p-n junction with the base region.

4,131,909

SEMICONDUCTOR INTEGRATED CIRCUIT ISOLATED THROUGH DIELECTRIC MATERIAL AND A METHOD FOR MANUFACTURING THE SAME

Takashi Matsuda; Kazuo Niwa, and Yasusuke Sumitomo, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1976, Ser. No. 735,784
Claims priority, application Japan, Oct. 25, 1975, 50-128773
Int. Cl.[2] H01L *27/12, 29/78, 27/02, 29/04*
U.S. Cl. 357—49 **6 Claims**



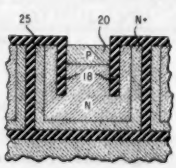
1. A semiconductor integrated circuit comprising:
a support body having a top surface and a first stepped recess in the top surface, the first recess having an upper step and a lower step;
a dielectric layer coated uniformly over the top surface and the first recess;
a first island region of material disposed over the dielectric layer in the first recess, the first island region forming a metal-oxide-semiconductor transistor element having separated source and drain regions on the upper step of the first recess and an insulated gate electrode on the lower step of the first recess.

4,131,910

HIGH VOLTAGE SEMICONDUCTOR DEVICES

Adrian R. Hartman, Westfield; James C. North, New Providence; George W. Reutlinger, Florham Park, and Peter W. Shackle, Bridgewater, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 9, 1977, Ser. No. 849,788
Int. Cl.[2] H01L *27/12*
U.S. Cl. 357—49 **11 Claims**



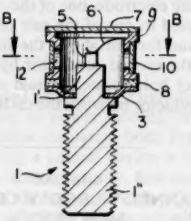
1. A high voltage semiconductor device comprising
a silicon substrate;
a body of monocrystalline silicon of a first conductivity type with a pair of major surfaces lying in the (110) crystallographic plane and one major surface bonded to the substrate;
a layer of insulating material between the body and substrate;
a first narrow groove with sidewalls lying in the (111) plane extending completely through said body on the periphery of the device and filled with a thermally grown silicon oxide so as to electrically isolate the device from other devices formed in the body;
a region of opposite conductivity type formed within said body so as to form a p-n junction in said body; and
at least one interior narrow groove with sidewalls lying in the (111) plane and filled with thermally grown oxide formed in the surface of said body opposite to said substrate adjacent to a portion of the region of opposite conductivity type, said groove extending a greater distance in said body than the region so that the field between the junction and adjacent portions of the device when the junction is biased is kept below the breakdown level of the body.

4,131,911

HERMETICALLY SEALED OPTO-ELECTRICAL SEMICONDUCTOR DEVICE

Nobuhiko Fujine, and Masato Nakajima, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Oct. 13, 1976, Ser. No. 732,138
Claims priority, application Japan, Oct. 15, 1975, 50-123905
Int. Cl.[2] H01L *23/02*
U.S. Cl. 357—74 **13 Claims**



1. A hermetically sealed opto-electrical semiconductor device comprising:
a cylindrical envelope made of metal having first and second ends and a side surface, said side surface having at least two openings disposed to permit the passage of light beams, and at least two grooves, the bottom portions of said grooves comprising flat portions disposed respectively about the periphery of each of said openings;
thin, flat plates of a transparent material having a thickness smaller than the depth of said grooves, each of said plates having one major face attached respectively to one of said flat portions of said grooves so that such plate covers one of said openings to hermetically seal said opening, said plates being placed over said openings in a direction perpendicular to the path of said light beams;
a disk shaped metal cap electrically and hermetically attached to the first end of said envelope;
an insulating ring attached to said second end of said envelope;
a metal ring hermetically sealed to said insulating ring;
a metal body hermetically sealed to said metal ring, said metal body having a first end portion extending through said metal ring into the interior of said envelope and a second end portion disposed outside said envelope and having a threaded exterior surface;
an opto-electrical semiconductor element having a first and second electrode surfaces, said first electrode surface being electrically connected to said first end portion of said metal body; and
means for electrically coupling said second electrode surface of said element to said envelope.

4,131,912

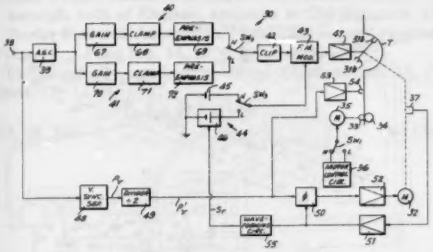
APPARATUS FOR RECORDING AND REPRODUCING VIDEO SIGNALS ON A MAGNETIC TAPE MOVABLE AT DIFFERENT SPEEDS

Jun Hirai, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jul. 5, 1977, Ser. No. 813,187
Claims priority, application Japan, Jul. 6, 1976, 51-80128
Int. Cl.[2] H04N *5/76*
U.S. Cl. 358—4 **57 Claims**

1. Apparatus for recording a video signal on a magnetic tape comprising:

modulating means for frequency modulating a carrier with said video signal to provide a frequency modulated signal;
drive means for selectively driving said tape at a plurality of different tape speeds;
transducer means receiving said frequency modulated signal and repeatedly traversing the tape at a uniform rate so that said transducer means records the frequency modulted



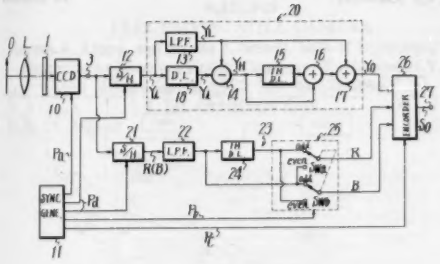
signal in successive parallel tracks on the tape with the pitch of said tracks being determined by the tape speed; and
means for changing the frequency deviation of said frequency modulated signal in accordance with the speed at which the tape is selectively driven so that said frequency deviation decreases with decreasing tape speed.

4,131,913

SOLID STATE TELEVISION CAMERA

Seisuke Yamanaka, Mitaka; Fumio Nagumo, Yokahama, and Toshimichi Nishimura, Tama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 7, 1977, Ser. No. 831,341
Claims priority, application Japan, Sep. 10, 1976, 51-108539
Int. Cl.[2] H04N 9/04
U.S. Cl. 358—44 **6 Claims**



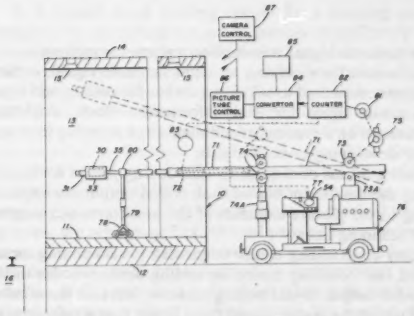
1. A solid state television camera having a solid state image sensing device including a plurality of individual light sensing units arranged in both horizontal and vertical rows comprising:
(a) means for establishing an image path for projecting an image of an object onto said image sensing device;
(b) a plurality of color filter elements arranged in horizontal rows within said light path, one horizontal row including color filter elements of differing transmissivities with certain ones passing light of a first primary color and certain other successive ones passing light representing all colors, an adjacent horizontal row including color filter elements of differing transmissivities with certain ones passing light of a second primary color and certain other successive ones passing light representing all colors, means for developing carriers representing said primary and all color (luminance) light;
(c) means for developing a luminance signal from each of said color filter elements;
(d) means for developing first and second color difference signals from each of said color filter elements in response to portions of respective rows of an image displayed thereon; and
(e) means for processing said first and second color difference signals as a desired simultaneous color video signal to be mixed with said developed luminance signal.

4,131,914

METHOD AND APPARATUS FOR INSPECTING REFRACTORY LINING IN COKE OVEN CHAMBERS AND THE LIKE

Francis H. Bricmont, Pittsburgh, Pa., assignor to Bricmont & Associates, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 615,988, Sep. 23, 1975, abandoned. This application Sep. 2, 1976, Ser. No. 719,858
Int. Cl.[2] H04N 7/18
U.S. Cl. 358—100 **24 Claims**



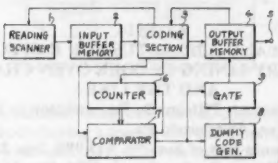
1. An inspection apparatus for inspecting the refractory lining in a high temperature chamber of a coke oven, a pneumatic steel treatment vessel, a reheat furnace for metallic workpieces and the like before and/or after treating the burden therein, said apparatus including the combination of:
a movable member to advance within said chamber in a direction along the refractory lining thereof,
support means externally of said chamber to carry said movable member,
an enclosure including side walls normally forming a substantially closed compartment, said enclosure being supported by said movable member for movement within said chamber, said enclosure including means for maintaining a thermally-protective environment within the compartment thereof,
drive means coupled to said movable member to displace said enclosure along the refractory lining of said chamber,
means carried within the compartment of said enclosure for producing a video signal corresponding to at least a portion of said refractory lining, said means including an optical lens exposed to the refractory lining through an opening in the side wall of said enclosure,
means for cooling said optical lens,
means supported by said movable member to adjustably position said means for producing a video signal, and
receiver means for displaying the video signal produced by the first said means and corresponding to at least a portion of said refractory lining.

4,131,915

FACSIMILE SIGNAL TRANSMISSION SYSTEM

Yukio Nakagome, Yokohama; Hiroichi Teramura, Tokyo; Yasuhiro Yamazaki, Hiratsuka, and Yasushi Wakahara, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Oct. 15, 1976, Ser. No. 732,597
Claims priority, application Japan, Oct. 16, 1975, 50/124716
Int. Cl.[2] H04N *7/12*
U.S. Cl. 358—260 **2 Claims**



1. A facsimile signal transmission system comprising:

input means for receiving an input facsimile signal; coding means connected to said input means for coding said input facsimile signal for each information block of picture elements on a predetermined number of scanning lines and for developing coded outputs;

counting means connected to said coding means for counting the number of bits of each coded output corresponding to the picture elements of the predetermined number of scanning lines;

dummy code adding means connected to said coding means and said counting means for adding dummy codes to the coded output of said coding means to increase the number of bits of the coded output to be larger than a reference bit number predetermining in consideration of the subscanning time on the receiving side when the count developed by said counting means is smaller than the reference bit number, said dummy code adding means comprising a comparator connected to said counting means for comparing the count of said counting means with said reference bit number provided therein to develop a pulse when the count of said counting means is smaller than the reference bit number, a dummy code generator for generating dummy codes in response to said pulse from said comparator, and an output buffer memory connected to said coding means, said dummy code generator and said output terminal means for adding to the coded output said dummy codes to develop said coded output with said added dummy codes; and

output terminal means connected to said dummy code adding means for sending out the coded output of said coding means with said dummy codes added thereto.

4,131,916

PNEUMATICALLY ACTUATED IMAGE SCANNING READER/WRITER

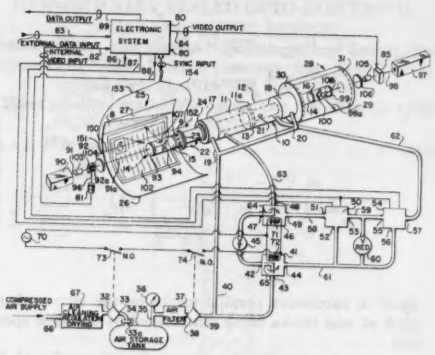
Robert M. Landsman, Annandale, Va., assignor to LogEtronics, Inc., Springfield, Va.

Filed Dec. 31, 1975, Ser. No. 645,583
Int. Cl.[2] H04N *3/00*
U.S. Cl. 358—285 **35 Claims**

1. In a scanning system of the type having means for supporting an element to be scanned and rotary optical scanning means for scanning said element, the improvement comprising means for providing smooth operation of the rotary scanning means, including fluid supply means and:

a. supporting means for supporting said rotary scanning means with fluid from said fluid supply means,

b. motor means operated by fluid from said fluid supply means for rotating said scanning means, and



c. translating means, driven by fluid from said fluid supply means, for translating said scanning means;

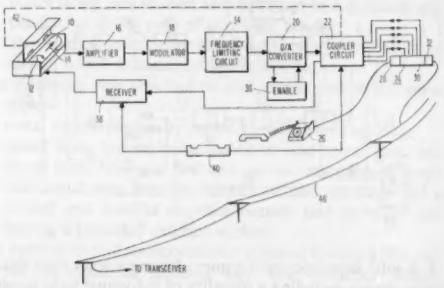
said motor means and said translating means cooperating to move said scanning means to perform a scanning operation.

4,131,917

FREQUENCY LIMITER

Jack D. Burton, Orlando, Fla., and John M. Vandling, Pleasantville, N.Y., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 21, 1977, Ser. No. 844,296
Int. Cl.[2] H04N *1/40*
U.S. Cl. 358—281 **10 Claims**



1. A facsimile transmitting apparatus for transmitting signals representing dark and light regions on a document, said apparatus comprising sensor means for sensing dark and light regions on the document and transmitting means for generating frequency modulated transmission signals representing the dark and light regions on the document, said transmitting means including signal generating means for generating a signal having a frequency substantially higher than the modulated transmission signal and converter means for converting the transmission signal from the higher frequency signal such that a light/dark or dark/light variation between the regions produces a change in frequency of the higher frequency signal which in turn produces a change in frequency of the transmission signal in a fraction of the transmission signal cycle, the improvement comprising frequency limiting means coupled between the signal generating means and the converter means

for limiting the frequency of the transmission signal by limiting the frequency of the input to the converter means.

4,131,918
PROVIDING CONTROL SIGNALS FOR MACHINE OPERATIONS

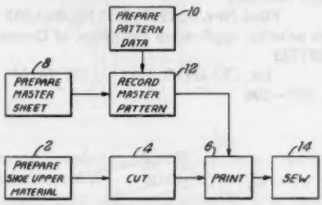
Donald Pettit, Isham, and Stephen G. Abbott, Market Harborough, both of England, assignors to The Shoe and Allied Trades Research Association, Northamptonshire, England

Filed Sep. 16, 1974, Ser. No. 506,297

Claims priority, application United Kingdom, Sep. 19, 1973, 43984/73

Int. Cl.² G11B *25/00*

U.S. Cl. 360—1 **44 Claims**



1. A method of controlling a machine carrying out machine operations on a workpiece along a predetermined path on a surface portion of said workpiece, said workpiece including magnetic material in an area substantially coextensive with said surface portion, said method comprising:

selectively magnetizing said material to record control instructions thereon;

moving said workpiece through said machine so that said machine operations are carried out along said path;

detecting said selective magnetization during said movement to produce control signals; and

utilizing said control signals to control said machine.

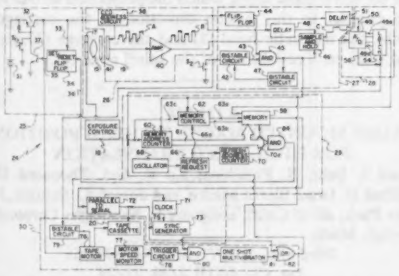
4,131,919
ELECTRONIC STILL CAMERA

Gareth A. Lloyd, and Steven J. Sasson, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1977, Ser. No. 798,956

Int. Cl.² H04N *5/79*

U.S. Cl. 360—9 **8 Claims**



1. In an electronic still camera having a solidstate light-responsive device for producing at a relatively high rate a stream of discrete signals indicative of optical images received by said device during adjacent exposure intervals, the improvement comprising:

(a) means for extracting said discrete signals from said light-responsive device during a time interval which is no greater than the interval during which said optical images are produced;

(b) circuit means for separating said signals from each other;

(c) means for transforming said separated signals into a stream of signals occurring at a rate which is slower than said high rate; and

(d) means for recording in real time on a non-volatile medium said slower rate stream of signals.

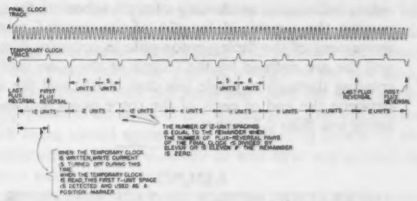
4,131,920
CLOSED-CLOCK WRITING SYSTEM FOR A ROTATING MAGNETIC MEMORY

James K. Berger, Malibu, Calif., assignor to Pioneer Magnetics, Santa Monica, Calif.

Filed Oct. 19, 1977, Ser. No. 843,555

Int. Cl.² G11B *5/09*

U.S. Cl. 360—51 **6 Claims**



1. A closed clock writing system for a rotating magnetic memory for recording a selected number of uniformly spaced magnetic flux reversals in a final clock track on the memory, said writing system comprising: a clock generating circuit for recording a plurality of magnetic flux reversals in a temporary clock track on the memory at a selected frequency and density corresponding to a selected sub-multiple of the flux reversals to be recorded in the final clock track, the clock generating circuit including circuitry for causing selected pairs of the flux reversals to be recorded in the temporary track at a certain frequency ratio to the flux reversal pairs in the final track, and to cause the remaining flux reversal pairs to be recorded in the temporary track at a different frequency ratio to the flux reversals in the final track to accommodate the remainder when the number of flux reversals in the final track is divided by a selected number; a clock reading circuit for sensing the flux reversals in the temporary track and for recording flux reversals at a higher frequency and density in the final clock track on the memory, and circuitry included in said clock reading circuit for causing the flux reversals to be recorded in the final track at a constant higher frequency and density than the pulses recorded in the temporary track regardless of the aforesaid frequency ratios.

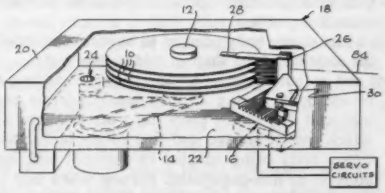
4,131,921
HEAD POSITIONING SYSTEM FOR DISC FILES

Norman P. Gruczelak, Santa Barbara, Calif., assignor to Okidata Corporation, Moorestown, N.J.

Filed Apr. 15, 1977, Ser. No. 787,885

Int. Cl.² G11B *21/00*

U.S. Cl. 360—86 **5 Claims**



1. A positioner mechanism for disc file systems comprising: an arm of relatively small mass extending to a free end from a pivot axis at the opposite end of the arm;

a head mount of relatively small mass and including at least one head pad, the head mount being coupled to the free end of the arm; and

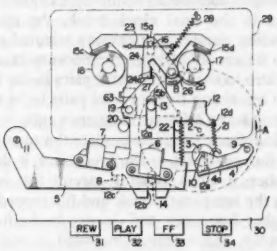
rotatable means coupled to said opposite end of the arm concentric with the pivot axis for driving the arm, the means for driving the arm including a magnetic rotor concentric with and rotatable about the pivot axis, the rotor having a mass substantially greater than the mass of the arm and the mass of the head mount, a magnetic core surrounding and concentric with said rotor, and means coupled to said core for energizing the core and including a coil about said core and proximate said rotor, said rotor comprising a plurality of poles, said coil comprising multiple coil segments, each of which is disposed in facing relation to a different rotor pole, each of said coil segments defining an arc having a length substantially encompassing the combined lengths of the arcs of rotational movement of the facing rotor pole in opposite directions and the arc defined by the length of the pole, said rotor rotating through an angle less than $\pm$ 15° and the air gap between the end of each of the rotor poles and the core being less than 0.1 inches.

4,131,922

OPERATION DEVICE OF TAPE RECORDER

Masashi Yoshida, Nakaminato; Yasuo Iino, Katsuta, and Katsuya Sato, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 27, 1977, Ser. No. 864,263
Claims priority, application Japan, Dec. 27, 1976, 51-156538
Int. Cl.[2] G11B *15/10, 15/26, 15/32*
U.S. Cl. 360—90 **10 Claims**



1. An operation device of a tape recorder comprising:

(a) A tape running driving system including, at least, a capstan adapted to be rotatively driven by a motor, a pinch roller mounted to confront said capstan for a movement to and from the latter, so as to cooperate with said capstan in feeding the tape at a constant speed, and a play plate adapted to control the movement of said pinch roller toward and away from said capstan;

(b) a manual operating system including a manually operable operation member for constant-speed tape feeding adapted to be displaced from a stopping position to an operation position, and a first locking member adapted to lock said manually operable operation member at said operation position;

(c) a first rotary body adapted to be rotated in relation with the rotation of the shaft of said motor; and

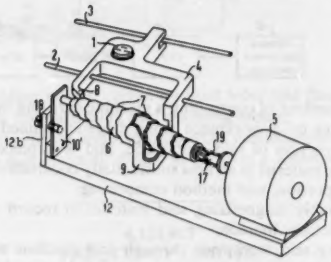
(d) and an automatic operation system including a second rotary body having an engageable portion engageable with said first rotary body and a non-engageable portion which cannot engage said first rotary body, said second rotary body being adapted to confront said first rotary body at its non-engageable portion when said operation member is not operated, but to be rotated when an initial torque is imparted thereto by the operation of said operation member, so as to bring said engageable portion to confront said first rotary body, so that it may be driven continuously by said first rotary body in accordance with the rotation of the latter, until said non-engageable portion comes again to confront said first rotary body, an actuating plate adapted to be displaced by the rotation of said second rotary body, so as to displace said play plate, thereby to put said pinch roller into cooperation with said capstan, and a second locking member adapted to lock said play plate at a position to which said play plate has been displaced.

4,131,923

MAGNETIC-HEAD LOCATING ARRANGEMENT FOR FLOPPY-DISK MECHANISMS

Walter Wachs, Krailling, and Heinz Stickel, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 9, 1977, Ser. No. 849,955
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1976, 2651733
Int. Cl.[2] G11B *5/55, 21/08, 21/14*
U.S. Cl. 360—106 **5 Claims**



1. A device for moving a magnetic head between various tracks on a recording carrier, in which the magnetic head is mounted on a carriage which is displaced utilizing a positioning motor, comprising a spiral cone (6) driven by the positioning motor (5), said spiral cone having a generally conical surface provided with inclined spiral flanks (7) forming a spiral screw of constant pitch on the conical surface, said spiral flanks having a radius which varies in proportion to the associated diameter of the spiral cone (6), and said carriage has at least one projection engaging the spiral flank (7) of the spiral cone (6) with said spiral cone being positioned such that the generatrix of the spiral flank along which the projection moves forms a line parallel to the motion direction of the carriage (4) whereby the magnetic head (1) and the carriage (4) are displaced with each revolution of the spiral cone (6).

4,131,924

FLEXURE MOUNTED MAGNETIC HEAD POSITIONER FOR HIGH-SPEED TRANSLATION

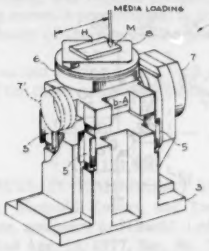
Michael I. Behr, S. Pasadena; Ko K. Gyi, Thousand Oaks; Wilfred D. Iwan, Sierra Madre, and Joseph C. Palotay, Newbury Park, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 3, 1977, Ser. No. 838,961
Int. Cl.[2] G11B *5/56, 21/24*
U.S. Cl. 360—106 **13 Claims**

1. In an improved head positioner arrangement for a disk drive apparatus, this arrangement including at least one head block presenting a plurality of multi-track transducer cores for operative disposition with a prescribed magnetic disk recording surface, said block(s) being mounted on first spring means and arranged and adapted to be resiliently reciprocated in a first direction, toward and away from such a surface in transducing relation therewith and further being arranged to be reciprocated, in a second direction, transverse said first direction, from track-to-track, over a prescribed "track-select"

excursion distance, radially, across the disk surface; the arrangement also including head support means carrying this head block; the combination therewith comprising:

opposed flexure pivot means, mounting said support means pivotably from said disk drive apparatus, the pivot means being selected and arranged to accommodate said track-select excursion, resiliently in said second direction; and electro-magnet actuator means mounted on said drive



apparatus and coupled to said support only electrically — and not mechanically — whereby to selectively pivot the support means over said excursion distance, reciprocatingly and against the return bias of said flexure pivot means;

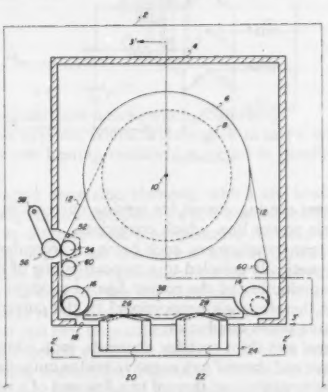
said first spring means being, further, adapted and operated to compensate for any shift of said block in said first direction which may be caused by so pivoting said support means in said second direction.

4,131,925

EDGE GUIDE FOR COOPERATION WITH A COAXIAL REEL CASSETTE

Ronald R. Firth, Fairport, and Jerry R. Horak, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 2, 1977, Ser. No. 821,113
Int. Cl.[2] G11B *23/04, 15/60*
U.S. Cl. 360—130 **5 Claims**



1. Web transport apparatus forming part of a narrow-track, linear-transport, magnetic recording device and cooperative with a coaxial-reel cassette of the type useful with a magnetic recording device, the cassette having supply and takeup reels mounted at separate levels, the reels having a span of web material extending therebetween, the cassette having a window across which the web is adapted to extend and associate with a magnetic head mounted on the recording device, the cassette further having:

a. a first tapered guide roller mounted within the cassette for guiding the web across the roller surface thereof from the level of the supply reel to a path across the window, said first tapered guide roller being mounted so as to urge the web in a first direction generally in the direction of the width of the tape in response to the web being advanced along said path; and

b. a second tapered guide roller mounted within the cassette for guiding the web across the roller guide surface thereof from said path across the window to the level of the takeup reel, said second guide roller being mounted so as to urge the web in said first direction in response to the web being advanced along said path,

said web transport apparatus comprising:

A. edge guiding means mounted on the recording device adjacent the head and extending substantially the full distance between said first and second guide rollers, said edge guiding means cooperating with said first and second tapered guide rollers for guiding a length of the web along an edge thereof past the head and from the level of the supply reel to the level of the takeup reel, said edge of the web being biased against said edge guiding means by the cooperative urging tendency of said first and second tapered guide rollers; and

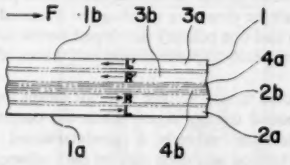
B. web drive means disposed to engage the web at a position outside of the span of web material extending between said first and second tapered guide rollers for advancing the web along said path without interfering with the cooperative action of said first and second tapered guide rollers and said edge guide means, thereby providing the critical edge guide requirements for a narrow-track, linear-transport magnetic recording device outside of the cassette.

4,131,926

MAGNETIC TAPE AND RECORDING METHOD THEREFOR

Toshio Morimoto, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed May 24, 1976, Ser. No. 689,147
Int. Cl.[2] G11B *5/78*
U.S. Cl. 360—134 **4 Claims**

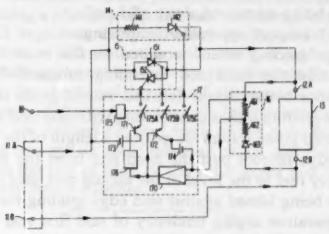


1. A magnetic tape for use in a recording and reproducing apparatus having means for recording signal information on the magnetic tape and for reproducing the recorded signal information therefrom, said magnetic tape comprising at least two main signal tracks of main information signals and positioned in spaced relation to each other and in positions adjacent to opposite side edges of said magnetic tape with respect to the longitudinal central axis of said magnetic tape, and at least two auxiliary signal tracks of auxiliary control signals positioned in the space between said two main signal tracks, the auxiliary control signals related to the main information signals of one of said main signal tracks being recorded only on the one of said auxiliary signal tracks positioned nearer the other of said main signal tracks, and the auxiliary control signals related to the main information signals of the other of said main signal tracks being recorded only on the auxiliary signal track positioned nearer said one of said main signal tracks.

4,131,927
A.C. POWER SUPPLY CIRCUIT WITH SURGE CURRENT SUPPRESSION

Takuichi Tsuchiya, and Shinichi Shinagawa, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 2, 1977, Ser. No. 821,102
Claims priority, application Japan, Aug. 3, 1976, 51-93025
Int. Cl.² H02H *9/00*
U.S. Cl. 361—6 **6 Claims**



1. An A.C. power supply circuit capable of surge current suppression comprising:

a pair of power input terminals for connection to an A.C. power source;

a pair of power output terminals connected to an inductive load;

an auxiliary current path connecting one of said input terminals to one of said output terminals, said auxiliary current path having a current limiting means and first controllable means responsive to a first control signal for passing only half waves of one polarity of an A.C. current supplied at said power input terminals;

means for applying a first control signal to said first controllable means;

a main current path connected in parallel with said auxiliary current path, said main current path having second controllable means responsive to a second control signal for connecting said one power input terminal to said one power output terminal and shunting said auxiliary current path;

a voltage detector means connected across said power output terminals for detecting a voltage of a second polarity opposite to said one polarity developed across said power output terminals in response to said half waves of said one polarity;

means connected to said voltage detector means for providing said second control signal when the output of said voltage detector exceeds a predetermined voltage, thereby to turn on said main current path subsequently to the turning on of the first current path in response to the first control signal.

4,131,928
VOLTAGE CLAMP DEVICE FOR MONOLITHIC CIRCUITS

William F. Davis, and Marc T. Stein, both of Tempe, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

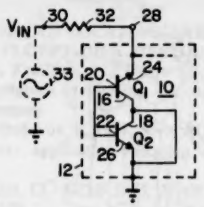
Filed Jun. 24, 1977, Ser. No. 809,600
Int. Cl.² H02H *3/22*
U.S. Cl. 361—56 **5 Claims**

1. A voltage clamp circuit suitable to be integrally fabricated in a monolithic integrated circuit for providing overvoltage protection to the integrated circuit, comprising:

first electron control means having first, second and control electrodes, said first electron control means being responsive to the magnitude of an alternating signal which is applied to an input of the integrated circuit reaching a first predetermined value for establishing a substantially constant voltage between said first and control electrodes thereof;

circuit means for coupling said first electrode of said first electron control means to the input of the integrated circuit; and

second electron control means having first, second and control electrodes, said second electron control means being responsive to the magnitude of the alternating signal reaching a second predetermined value for establishing a

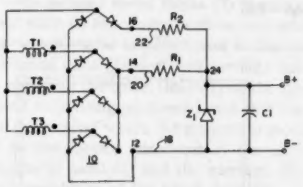


substantially constant voltage between the first and control electrodes thereof, said first electrode of said second electron control means being connected to the substrate region of the integrated circuit, said second electrode of said second electron control means being connected to said second electrode of said first electron control means and to said substrate region, said control electrode of said second electron control means being connected to said control electrode of said first electron control means.

4,131,929
BRIDGE CIRCUITS FOR SENSING CURRENTS IN A THREE-PHASE A.C. CIRCUIT

Richard J. Moran, Milwaukee, Wis., assignor to McGraw-Edison Company, Elgin, Ill.

Filed Mar. 24, 1977, Ser. No. 780,815
Int. Cl.² H02H *3/08*
U.S. Cl. 361—93 **9 Claims**



1. A current sensing circuit for sensing currents in a three-phase electric power line, which comprises:

three current transformers, each having a secondary winding magnetically coupled to a respective one of the three phase conductors of the power line to produce an A.C. current therethrough proportional to the current in the respective phase conductor;

first, second and third rectifier elements, each connected at a positive end thereof to a negative bridge output and at an opposite negative end thereof to a first end of a respective one of the current transformer secondary windings;

fourth, fifth and sixth rectifier elements, each connected at a positive end therof to the first end of a respective current transformer secondary winding and at an opposite negative end thereof to a positive bridge output;

a seventh rectifier element, connected at a positive end thereof to the negative bridge output and at an opposite negative end thereof to an opposite second end of each of the three current transformer secondary windings;

an eighth rectifier element, connected at a positive end thereof to the second end of each of the current trans-

former secondary windings and at an opposite negative end thereof to a mutual bridge output;

first, second and third connecting means for respectively connecting the mutual, positive, and negative bridge outputs to a common point, whereby current flowing through the first connecting means is proportional to one polarity of the power line neutral current, current flowing through the second connecting means is proportional to the instantaneous sum of one polarity of the power line phase currents, and current flowing through the third connecting means is proportional to the instantaneous sum of one polarity of the power line phase and neutral currents; and

at least two current sensing means, each disposed in a respective one of the three connecting means, for sensing current therein.

4,131,930
THERMAL TIME-DELAY SWITCH

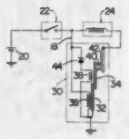
Matsuo Amano; Sigeyuki Kobori, and Toru Sugawara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

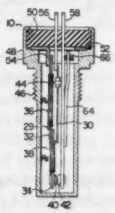
Filed Apr. 13, 1977, Ser. No. 787,102

Claims priority, application Japan, Apr. 22, 1976, 51-46160; Jun. 18, 1976, 51-71189; Jul. 9, 1976, 51-80886; Jul. 14, 1976, 51-82969

Int. Cl.² H01H *61/02*

U.S. Cl. 361—211 **3 Claims**





1. A thermal time-delay switch comprising:

a pair of opposed contacts connected in series with a load;

at least one heating resistor connected in parallel with the load;

cooperating bimetallic elements which are heated by said heating resistor comprising a first bimetallic element operable to displace with a temperature rise in a direction in which one of the contacts is separated from the other contact, a second bimetallic element operable to displace with the temperature rise a direction in which one of the contacts is engaged with the other contact, wherein one end of said first bimetallic element is coupled with one end of said second bimetallic element, the other end of one of said first and second bimetallic element is integrally secured to a switch body, and the other end of the other of said first and second bimetallic elements is attached with one of said contacts, and wherein the amount of displacement of the contact due to the temperature rise in the first bimetallic element is different from the amount of displacement of the contact due to the temperature rise in the second bimetallic element so that the contacts are switched with a substantially predetermined time delay substantially independent of fluctuations over a wide range of a voltage feeding said heating resistor; and

a contact supporter having one end attached with the other of said contacts and the other end integrally secured to the switch body, said contact supporter including a first strip member integrally secured to the switch body and a second strip member having a free end biased in a direction of said opposing contacts to come into contact with said first strip member, and means disposed in close vicinity of the free end of the second strip member for adjusting the distance between said first and second strip members.

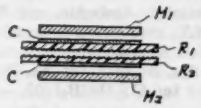
4,131,931
IMPREGNATED CAPACITOR

Shigeyoshi Nishikawa, Koga; Takashi Muroshima, Moriyama; Hirokazu Sakaguchi, Kusatsu; Morihiko Hasebe, Omihachiman; Katsuji Katagiri, Kyoto, and Kazuo Inoue, Koga, all of Japan, assignors to Nichicon Capacitor, Ltd., Japan

Continuation-in-part of Ser. No. 716,594, Aug. 23, 1976, abandoned. This application Feb. 14, 1978, Ser. No. 877,611

Int. Cl.² H01G *4/04*

U.S. Cl. 361—315 **5 Claims**



1. A rolled capacitor, comprising a plurality of metal electrode foils and a plurality of insulator separation films, wherein each of said films consists of a synthetic resin film having one surface roughened and the other surface coated with a metal layer.

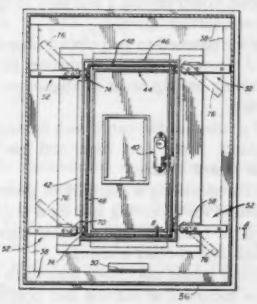
4,131,932
COVER ASSEMBLY FOR PANELBOARD

Walter T. Brumfield, Jr., Nicholasville; Norman M. Newsome, and George E. Schweikle, both of Lexington, all of Ky., assignors to Square D Company, Park Ridge, Ill.

Filed Oct. 17, 1977, Ser. No. 842,429

Int. Cl.² H02B *1/08*

U.S. Cl. 361—356 **8 Claims**



1. A cover assembly for use in a panelboard having a cabinet supporting an interior assembly for extending a plurality of electrical connections with said cabinet including a back wall having a peripheral wall formed by side walls transverse to said back wall with each side wall having projecting flanges in spaced overlapping relationship to said back wall, the improvement comprising:

a cover adapted to extend past each of said flanges,

a plurality of spaced latch lever assemblies,

first pivot means for each latch lever assembly pivotally supporting a respective one of said latch lever assemblies for rotation about a respective axis located at a respective

position spaced intermediate said flanges for engaging a respective one of said flanges, and

second means for each first means for pivotally supporting a respective one of said first pivot means for thereafter rotating each latch lever assembly relative said cover about another respective axis for moving said cover toward said flanges.

4,131,933

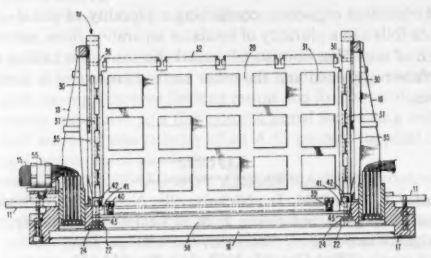
QUICK DISCONNECT CARD-ON-BOARD ELECTRONIC PACKAGE ASSEMBLY

Richard L. Agard; Terrence E. Bocinski, both of Binghamton; Lawrence E. Brearley, Apalachin, and William R. Yaple, Endwell, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 29, 1977, Ser. No. 792,153

Int. Cl.² H02B *1/02*

U.S. Cl. 361—415 **1 Claim**



1. A card-on-board electronic package assembly which comprises:

a printed circuit board having a plurality of spring contacts arranged on a surface thereof;

a board stiffener fastened to said circuit board and having a plurality of channels with each channel provided with a contact housing having holes in alignment with contacts on said board;

a plurality of printed circuit cards each having a plurality of blade contacts along one edge and each card being mounted in a card holder;

a card guide frame having a plurality of grooves across the top and bottom for receiving said card holders and cards and guiding the blade contact edges of inserted cards into said channels and contact housings;

captive fastening means associated with each card comprising a screw mounted at the top and bottom of the card with each screw having a retainer clip attached thereto, said screws being effective when tightened one at a time to secure inserted cards to said board stiffener with their blade contacts in engagement with the board spring contacts and operable when loosened to disconnect secured cards from said board stiffener for removal;

a latching tab provided on the top and bottom edge of each card holder and the top and bottom grooves in the card guide frame each have a recessed portion which coact with said tabs to latch inserted card holders against vertical movement and prevent either the top or bottom edge of the cards from lifting when the opposite edge is tightened.

4,131,934

RECEPTACLE FIXTURE FOR EQUIPMENT UNITS IN ELECTRICAL COMMUNICATION TECHNOLOGY

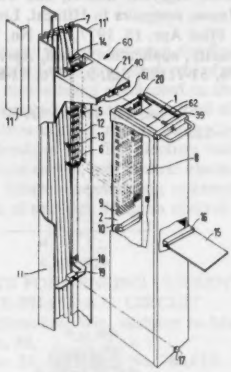
Harry Becker, Wolfratshausen; Karl Doerflinger; Klaus Ey, both of Munich; Georg Reiter, Schliersee; Hermann Ruttmoser, Munich, and Richard Theus, Wolfratshausen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jun. 24, 1977, Ser. No. 809,652

Claims priority, application Fed. Rep. of Germany, Jun. 25, 1976, 2628489

Int. Cl.² H02B *1/00*

U.S. Cl. 361—428 **4 Claims**

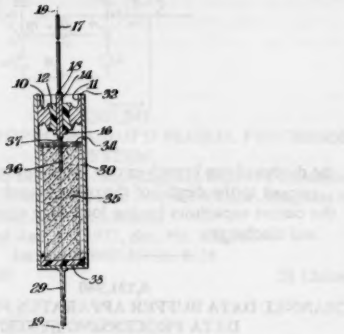


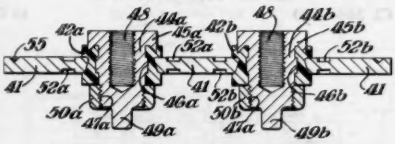
1. In a receptable fixture including equipment units in electrical communication technology, each of said equipment units having a housing containing plug-in component assemblies, said fixture comprising a pair of spaced, elongated spars forming a cable chute and having a contact strip supported by at least one of said spars with a first group of wrapping posts protruding from a surface thereof for forming connections with a central office and ring wiring, said fixture having a bracket-like mounting assembly for each of the equipment units spaced and secured along said spars, said mounting assemblies including guiding slides which receive each equipment unit housing and fastening means for attaching the housing to the fixture, each housing having a printed circuit board provided with internal wiring for the equipment unit disposed on a side of the housing adjacent to the spar contact strip, the improvements comprising the printed circuit board of each housing being provided with openings receiving the wrapping posts of the spar contact strip with the wrapping posts protruding through the openings and into the housing, additional contact posts being provided on an inner surface of the printed circuit board and extending therefrom into the interior of the housing, said additional contact posts being electrically connected to printed conductors on each circuit board, and each plug-in component assembly having an elongated spring contact strip forming electrical contact with the wrapping posts of the spar contact strip and the additional contact posts as the plug-in component assembly is plugged into the housing of the equipment unit.

4,131,935
TERMINAL-COVER ASSEMBLY HAVING COINED REGION OF REDUCED CROSS SECTION COMPRESSING RESILIENT BUSHING

Warren J. Clement, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Continuation of Ser. No. 556,248, Mar. 7, 1975, abandoned. This application Mar. 31, 1977, Ser. No. 783,376
Int. Cl.[2] H01G 9/00
U.S. Cl. 361—433 8 Claims





1. A terminal-cover assembly for an electrical component package comprising a generally planar surface metal cover member having a hole therein, an insulating bushing of resilient material being mounted in said cover hole, said bushing having a hole therein, a metal terminal being mounted in said bushing hole, the planar surface of said cover member having a coined region of reduced cross section spaced laterally from and surrounding said bushing, and cold-flowed material of said cover member between said coined region and said bushing compressing said bushing so as to form a first seal between said cover and said bushing and a second seal between said terminal and said bushing.

4,131,936
SYMMETRICAL PHASE SHIFTING APPARATUS, DIGITAL DELAYING DEVICE USED THEREIN AND HARMONIC NEUTRALIZED INVERTER SYSTEM USING THE APPARATUS

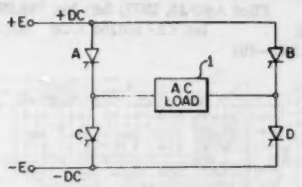
Robert S. Gemp, Williamsville, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 7, 1977, Ser. No. 774,726
Int. Cl.[2] H02M 7/155
U.S. Cl. 363—43 7 Claims

1. In an harmonic-neutralized inverter system for the generation of an alternating wave of fundamental frequency and of voltage magnitude adjusted by phase shift modulation technique in relation to a voltage control signal, including N square wave-inverter stages at π/N from one another controlled by conduction control signals spaced by an amount proportional to said voltage magnitude; means responsive to the outputs of said inverter stages for amplifying the same in relation to a cosine function of the stage rank; and means for summing the amplified outputs of said amplifying means to reconstruct said alternating wave of fundamental frequency; the combination of:

first means responsive to one time wave of said fundamental frequency for shifting said one time wave to the left in proportion to said voltage control signal;

second means responsive to said one time wave for shifting said one time wave to the right in proportion to said voltage control signal,



left shift register means responsive to said left shifted time wave for generating a first set of N said conduction control signals shifted to the left by a desired amount;

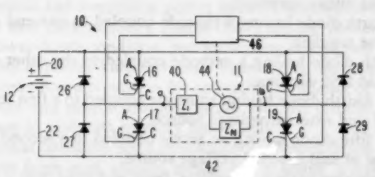
right shift register means responsive to said right shifted time wave for generating a second set of N said conduction control signals shifted to the right by said desired amount;

each of said N inverter stages being responsive to a corresponding pair of said conduction control signals derived from said first and second sets.

4,131,937
NATURALLY COMMUTATED VOLTAGE-FED CONVERTER FOR LINKING A DC SOURCE TO AN AC SYSTEM

Brian R. Pelly, Lingfield, England, and Peter Wood, Murrysville, Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed May 14, 1976, Ser. No. 686,422
Int. Cl.[2] H02M 7/515
U.S. Cl. 363—96 14 Claims



1. A naturally-commutated voltage-fed converter interfacing a relatively low impedance alternating-current (AC) system having first and second complementary terminals and a direct-current (DC) system having first and second complementary terminals for effecting power conversion comprising:

(a) a thyristor bridge means including a first thyristor means coupling said first DC system terminal to said first AC system terminal;

a second thyristor means coupling said second DC system terminal to said second AC system terminal;

a third thyristor means coupling said first DC system terminal to said second AC system terminal;

a fourth thyristor means coupling said second DC system terminal to said first AC system terminal;

diodemeans coupled antiparallel across each said thyristor means; and

(b) means operative to cyclically trigger said thyristor means, including means to sense the current phase in said AC system, for inducing a commutating voltage at said AC system terminals, wherein the fundamental component of current between said DC system and said AC

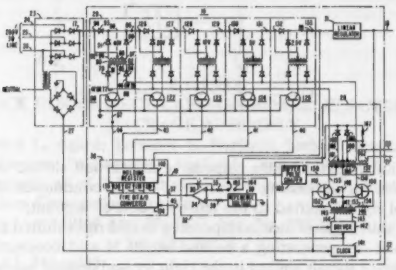
system invariably leads said commutating voltage, providing a reverse current for effecting commutation of each said thyristor means.

4,131,938

DIGITAL CHOPPER REGULATOR

Walter E. Milberger, Severna Park, and Frederick J. Rowe, Millersville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 15, 1977, Ser. No. 788,093
Int. Cl.[2] H02M *3/08*
U.S. Cl. 363—101 **12 Claims**



1. A boost circuit for injecting a voltage from an external voltage source between an input and output terminal in response to a control signal and at other times coupling by means of a conductive path, said input terminal to said output terminal comprising:

a first diode having an anode coupled to said input terminal and a cathode coupled to said output terminal;

a transformer having a first winding with a center tap and a second winding with a center tap, said center tap of said second winding coupled to said input terminal;

a second diode having an anode coupled to one end of said second winding;

a third diode having an anode coupled to the other end of said second winding;

said second and third diodes having a cathode coupled to said output terminal;

a fourth diode having a cathode coupled to one end of said first winding;

a fifth diode having a cathode coupled to the other end of said first winding;

said fourth diode having an anode coupled to a first terminal of said external voltage source;

said fifth diode having an anode coupled to a second terminal of said external voltage source;

a transistor having an emitter, base, and collector;

said emitter coupled to a return path of said external voltage source;

said collector coupled to said center tap of said first winding; and

said base coupled to said control signal.

4,131,939

CONSTANT CURRENT POWER SUPPLY

Ralph D. Day, 117 NW. 94th St., Miami Shores, Fla. 33153

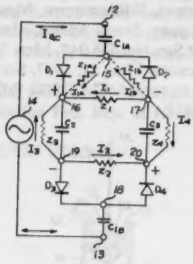
Filed Mar. 30, 1977, Ser. No. 782,913
Int. Cl.[2] H02M *7/06*
U.S. Cl. 363—126 **8 Claims**

1. A constant current power supply for multiple d.c. loads, comprising

a pair of A.C. input terminals,

an input capacitor connected at one side to one of the input terminals, and means for providing a constant current through a load, said means comprising

a pair of parallel branch circuits each connecting the other side of said input capacitor to the other input terminal, each of said branch circuits being a series circuit including a first diode, a positive D.C. output terminal, a fixed output capacitor, a negative D.C. output terminal, and a second diode,



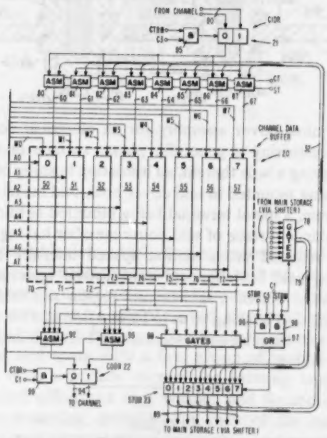
the diodes of one branch circuit being oppositely poled with respect to the diodes of the other branch circuit, and the output capacitors having long time constants of charge and discharge.

4,131,940

CHANNEL DATA BUFFER APPARATUS FOR A DIGITAL DATA PROCESSING SYSTEM

James T. Moyer, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 25, 1977, Ser. No. 818,797
Int. Cl.[2] G06F *13/00, 3/00*
U.S. Cl. 364—200 **10 Claims**



1. In a data processing system having channel circuitry for sending data to and receiving data from input/output devices and a main storage unit for storing data to be processed, the apparatus comprising:

a data buffer for buffering data being transferred between the channel circuitry and the main storage unit, this data buffer being structured to electrically provide a plurality of columns and rows, each column thereof being comprised of a byte-wide multiple row storage array having its own address mechanism for accessing any desired one of the rows therein, the corresponding rows in the different arrays serving to provide plural-byte rows for the data buffer as a whole;

plural-byte data transfer circuitry for transferring plural-byte data segments between the data buffer and at least one of the channel circuitry and the main storage unit;

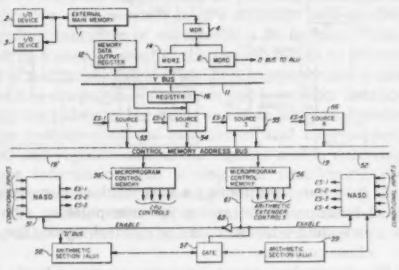
and data buffer address circuitry operatively coupled to said main storage unit and said channel circuitry for supplying

a plural-bit address obtained therefrom to the address mechanism of each storage array and including circuitry for modifying the address supplied thereby to at least one of the address mechanisms when said plural-bit address requires simultaneous accessing of a plural-byte storage segment located on two different rows of two columns the data buffer.

4,131,941
LINKED MICROPROGRAMMED PLURAL PROCESSOR SYSTEM

Harvey L. Siegel; Gerald F. Muething, Jr., both of Pleasanton, and Edward J. Radkowski, Palo Alto, all of Calif., assignors to Itek Corporation, Lexington, Mass.

Filed Aug. 10, 1977, Ser. No. 823,360
Int. Cl.[2] G06F *15/16, 9/16*
U.S. Cl. 364—200 **24 Claims**



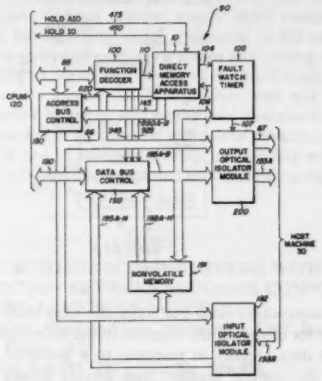
1. A processor network comprising at least first and second microprogrammed digital processors,

1. each of said processors including:
   a. microprogram control means;
   b. control memory address bus for carrying microprogram sequencing information;
   c. an operation code mapping memory for generating an address code for addressing said microprogram control means via said control memory address bus;
   d. an arithmetic logic unit for receiving input data to be processed;
   e. data transfer means coupled between the output circuit of said microprogram control means and an input control circuit of said arithmetic logic unit;
   f. microprogram sequencer source means for sequencing said microprogram control means via the address bus;
   g. next control memory address source designator coupled to said arithmetic logic unit for selectively coupling said microprogram sequencer source means or said operation code mapping memory of one or the other(s) of said processors to said address bus depending upon the nature of the data generated by said arithmetic logic unit and/or other conditional input data transmitted to said memory address source designator;
2. means for coupling said microprogram address busses of said processors together at least part of the time for exchanging microprogram sequencing information between processors; and
3. means coupled between the arithmetic logic unit sections of said processors to provide for the selective flow of data between the arithmetic logic unit sections of said processors.

4,131,942
NON-VOLATILE STORAGE MODULE FOR A CONTROLLER

Kenneth Gillett, Redondo Beach, Calif.; Edward L. Steiner, Macedon, N.Y.; Kenton W. Fiske, Fairport, N.Y.; Kenneth A. Davis, Honeoye Falls, N.Y.; William P. Kukucka, Webster, N.Y.; Thomas Criswell, Venice, and Philip Richardson, Pacific Palisades, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1977, Ser. No. 758,111
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **28 Claims**



1. In a controller including a central processor coupled to a system bus having control, data and address lines therein for directing the control registers of a host machine, a non-volatile storage module comprising:

a) data memory means operative to interface with the system bus for storing data, and for input-output of signals on the data lines of the system bus upon command of the central processor;
b) means coupled to said data memory means for distributing a plurality of power signals from the host machine onto critical and noncritical power lines for transmittal thereof to said data memory means, for sourcing power for a power-down condition, and for sensing that signals on the critical power lines from said distributing means are in a power-down condition for activating switching of power from said power sourcing means into the critical power lines to said data memory means and
c) means operative upon indication of a power-down condition from said sensing means for enabling a currently addressed signal on the data lines of the system bus to be processed by said data memory means.

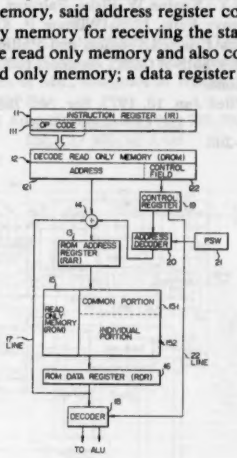
4,131,943
MICROPROGRAMMED COMPUTER EMPLOYING A DECODE READ ONLY MEMORY (DROM) AND A MICROINSTRUCTION READ ONLY MEMORY (ROM)

Yukio Shiraogawa, Fuchu, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Jun. 17, 1977, Ser. No. 807,499
Claims priority, application Japan, Jun. 30, 1976, 51-76418
Int. Cl.[2] G06F *9/16, 13/00*
U.S. Cl. 364—200 **10 Claims**

1. A microprogrammed computer comprising an instruction register for registering a machine instruction word; a decode read only memory connected to said instruction register for storing the start address data of microprogram routines which correspond to machine instruction words, respectively and the control bit data which correspond to the machine instruction words, respectively, said microprogram routines each consisting of a plurality of microinstructions; a control register for

registering the control bit data, one at a time; a read only memory for storing the microinstructions of the microprogram routines; an address register for registering an address datum based on which a specified microinstruction is read out from the read only memory, said address register connected to the decode read only memory for receiving the start address data from said decode read only memory and also connected to the input of said read only memory; a data register for storing the



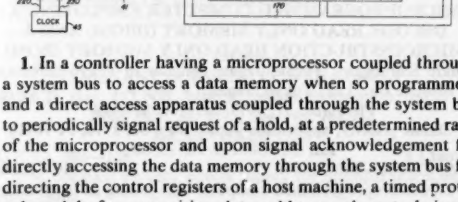
microinstruction read out from the read only memory; first means for changing the function of the microinstruction stored in the data register in response to a specified control signal from the control register; and second means for feeding a specified address datum to the address register in preference to the start address data sent to the address register from the decode read only memory in response to a specified control signal from the control register, thereby changing the execution sequence to the microprograms in the read only memory.

4,131,944

SYSTEM BUS MODULE FOR A CONTROLLER

George E. Mager, Manhattan Beach; Frank M. Nelson, Sherman Oaks, and Warren L. Hall, Palos Verdes, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 12, 1977, Ser. No. 758,892
Int. Cl.² G06F *13/00*
U.S. Cl. 364—200 **37 Claims**



1. In a controller having a microprocessor coupled through a system bus to access a data memory when so programmed, and a direct access apparatus coupled through the system bus to periodically signal request of a hold, at a predetermined rate, of the microprocessor and upon signal acknowledgement for directly accessing the data memory through the system bus for directing the control registers of a host machine, a timed protocol module for supervising data, address and control signals transported on the system bus, comprising:

(a) diriment means coupled to the microprocessor for predeterminably establishing the protocol of timing for receipt of a hold control signal on the system bus from the direct access apparatus for signaling hold thereof and for transmission of the acknowledgement signal as first and second control signals on the system bus from the microprocessor for acknowledgement thereof;

(b) address interface means coupled through the system bus to the microprocessor for disenabling the throughput of address signals therefrom upon receipt of the first control acknowledgement signal on the system bus from said diriment means; and

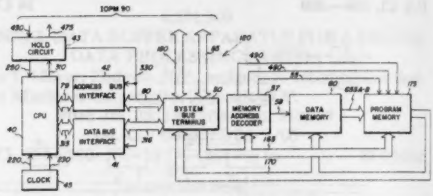
(c) data interface means coupled through the system bus to the microprocessor for bidirectionally disenabling the throughput of data signals therefrom upon receipt of the second control acknowledgement signal on the system bus from said diriment means.

4,131,945

WATCH DOG TIMER MODULE FOR A CONTROLLER

Philip Richardson, Pacific Palisades, Calif.; Edward L. Steiner, Macedon, N.Y.; John W. Daughton; Kenton W. Fiske, both of Fairport, N.Y., and Thomas Criswell, Venice, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 10, 1977, Ser. No. 758,120
Int. Cl.² G06F *9/00, 13/00*
U.S. Cl. 364—200 **18 Claims**



1. A system for directing a host machine comprising:

(a) microprocessor means for manipulating data and for providing address, data and control signals for host machine control;

(b) system bus means operative to dependently interface with said microprocessor means for bidirectionally carrying the data, address and control signals;

(c) data memory means coupled to said system bus means for storing the data signals, and for read-write interfacing through the address signals received on said system bus means;

(d) direct access means operative to receive a predetermined periodic enabling address signal on said system bus means from said microprocessor means for issuing a hold signal thereto after a predetermined period for operational suspension, and subsequently upon acknowledgement after a predetermined period for control assumption of said system bus means for generating active state control and address signals to said system bus means that will directly access said data memory means for host machine update; and

(e) fault timer means operative to receive the active state control signal from said direct access means for self resetting, and upon non receipt thereof for generating a hold signal after a predetermined period through said direct access means to said microprocessor means and a fault signal for host machine disable.

4,131,946

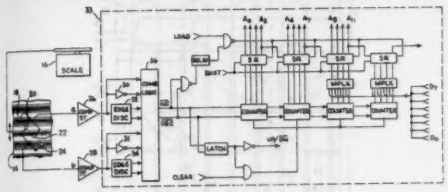
MAILING SYSTEM

Daniel F. Dlugos, Huntington, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 14, 1976, Ser. No. 750,534
Int. Cl.² G06F *15/20;* G01G *23/42*
U.S. Cl. 364—466 **7 Claims**

1. A weighing system for weighing an article, the system including a spring scale for measuring the weight of the article as a function of the deflection of a load support for carrying the

article, the scale comprising means for generating an optical cyclic pattern, the generating means including means moving the pattern as a function of the load support deflection, opto-electronic transducer means, the pattern being projected upon the transducer means, the transducer means generating a pair of cyclic waveforms as a function of the deflection of the load support, the system further including an interface and a processing unit, the interface being disposed in the system between the transducer means and the processing unit, the interface including digital wave shaping means, the digital wave shaping means receiving the cyclic waveforms and in response thereto providing a pair of shaped digital waveforms, sensing means, the sensing means receiving the shaped waveforms and sensing



movement of the load support and to provide one series of pulses indicative of movement in one direction and another series of pulses indicative of movement in an opposite direction, counting means coupled to the sensing means to receive either one of said series of pulses, and in response thereto in one instance adding the pulses of one series and in another instance subtracting the pulses of the other series to provide counter information indicative of the measure of said load support movement, and register means, the register means receiving the counter information and storing and transferring the counter information to the processing unit, the processing unit receiving the counter information and in response thereto processing said counter information for determining article weight.

4,131,947

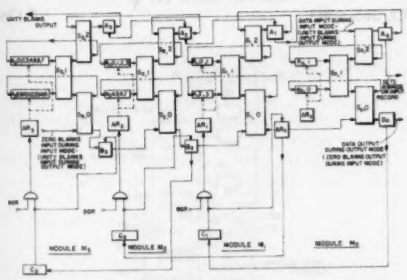
RANDOM ACCESS DIGITAL SORTER

Philip N. Armstrong, 17331 Keegan Way, Santa Ana, Calif. 92705

Continuation of Ser. No. 712,268, Aug. 6, 1976, abandoned. This application Dec. 9, 1977, Ser. No. 859,267

Int. Cl.[2] G06F *7/06*

U.S. Cl. 364—900 **17 Claims**



1. A system for sorting a plurality of multi-bit binary records, each record being identified by a multi-bit key, and said records being sorted into an ascending or descending order with respect to the keys of successive records, said system including a plurality of modules intercoupled with one another to represent a plurality of sorting levels, any of said modules including: a pair of random access memories, each of said memories having a predetermined number of memory cells greater than one; address register means coupled to said pairs of random access memories for selectively designating pairs of the memory cells therein; first comparing network means having a first pair of inputs respectively coupled to said pair of random access memories for comparing pairs of records from said random access memories as selected by said address register means and having first and second outputs; second comparing network means having first and second outputs and having a first input connected to the first output of said first comparing network means and having a second input coupled to the first output of the second comparing network means of a first adjacent module, and said second comparing network means of said one of said modules having its second output coupled to one of the pair of random access memories of said one of said modules for introducing records to the memory cells therein designated by said address register means; third comparing network means having a first input connected to the second input of the first comparing network means and having a second input coupled to the second output of the third comparing network means of a second adjacent module, and said third comparing network means of said one of said modules having a first output coupled to the other of said pair of random access memories of said one of said modules for introducing records to the memory cells therein designated by said address register means.

4,131,948

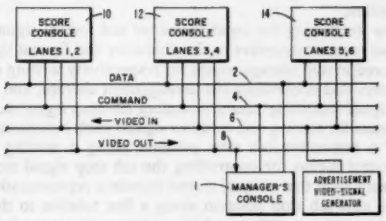
ELECTRONIC BOWLING SCORING SYSTEM WITH BUS COMMUNICATION BETWEEN MANAGER CONSOLE AND LANE SCORE CONSOLES

Reginald A. Kaenel, Weston, Conn., assignor to AMF Incorporated, White Plains, N.Y.

Filed Jan. 31, 1977, Ser. No. 764,431

Int. Cl.[2] G06F *3/00*

U.S. Cl. 364—900 **9 Claims**



1. A bowling scoring system for a plurality of power on bowling lanes including a manager's console unit comprising a keyboard, in memory means, a processing unit connected to said keyboard and said memory means for developing address and command information for storing into said memory means and a CRT monitor coupled to said character generator for displaying information based on the key depressed on said keyboard,

a plurality of lane score terminals each comprising memory means for storing bowler lane and game score information, a processing unit for processing said information, a CRT monitor responsive to a character generator coupled to said memory means for displaying the output of said processing unit,

a plurality of communication buses for connecting said manager's console and said score terminals in parallel each of said score terminals including in said memory means a plurality of addressable flag registers and a pointer register, said manager's console including means for transmitting the address of said flag registers to said pointer register and for transmitting a command to said processing unit at said lane score terminal in response to key depressions at said keyboard at said manager's console,

said lane score terminal being responsive to said command from said manager's console to read the register address of one of said plurality of addressable registers stored at said

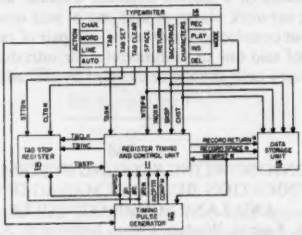
pointer register and to operate on said addressed register as required by said conmand code, whereby the lane score terminal is responsive to said commands from said manager's cosole unit to modify said processing of said information at said lane score terminal.

4,131,949

WORD PROCESSOR APPARATUS HAVING MEANS FOR RECORDING A TAB FUNCTION AS A SIGNAL INDICATIVE OF THE NUMBER OF SPACES TABBED

Steven J. Fletcher, Norristown; Jeffrey L. Wright, Philadelphia, and Richard S. Davis, Blue Bell, all of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sep. 10, 1975, Ser. No. 612,165
Int. Cl.[2] G06F *1/00*; B41J *25/18*
U.S. Cl. 364—900 **11 Claims**



1. Word processor apparatus comprising:

input means for providing input character signals representative of characters to be written and input format signals for controlling the arrangement of the characters when written,

means for storing the input character and format signals,

output means responsive to the character and format signals stored in said storage means for respectively writing characters and controlling the arrangement thereof, and

tab signal recording means including tab stop signal storage means for storing one or more signals each representative of a respective tab stop position along a writing line, control means for controlling the tab stop signal storage means such that a signal stored therein is representative of the next tab stop position along a line relative to the instant writing position, and means responsive to a tab input format signal supplied from the input means and a signal supplied from the tab stop signal storage means representative of the next tab stop position from the instant writing position at the occurrence of the tab input format signal for generating and storing in said storage means a succession of encoded space format signals corresponding to the number of writing positions to the next tab stop position from the instant writing position.

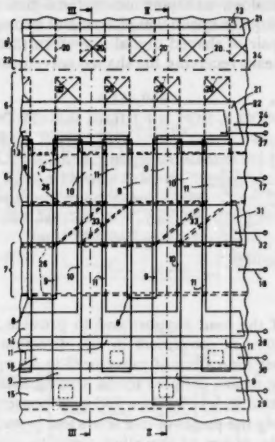
4,131,950

CHARGE TRANSFER DEVICE

Johannes G. van Santen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,278
Claims priority, application Netherlands, Sep. 2, 1975, 7510311
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—183 **13 Claims**

1. A charge transfer device comprising a semiconductor body having a semiconductor layer, barrier means and a row of charge storage sites for storing mutually separated charge packets, read-out means for providing an output from said charge transfer device, a plurality of parallel-arranged juxtaposed charge transfer shift registers, each having an array of electrodes which are separated from said semiconductor layer of the semiconductor body by said barrier means and which form an array of capacitances with the underlying semiconductor material in which charge packets can be stored and be transferred to said read-out means, electrode means between the row of charge storage sites and the adjacent shift register and between adjacent shift registers which are separated from the semiconductor layer by said barrier means, for distributing charge packets stored in the row of charge storage sites between the shift registers, each of the shift registers receiving an equal part of the total number of the charge packets to be



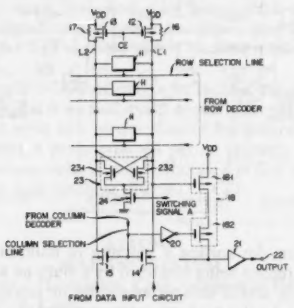
distributed, means for distributing to each shift register charge packets originally separated from each other in the row of storage sites by a number of intermediate charge packets equal to one less than the number of registers, the charge packets received by a selected shift register being supplied by said electrode means and with the exception of the first register via the registers present between said selected register and the row of storage sites, and means for shifting the charge packets distributed between the registers to the read-out means.

4,131,951

HIGH SPEED COMPLEMENTARY MOS MEMORY

Hiroji Asahi, Zama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed May 17, 1977, Ser. No. 797,816
Int. Cl.[2] G11C *11/40*
U.S. Cl. 365—203 **7 Claims**



1. A high speed complementary MOS memory comprising:

first and second data bus lines and row selection lines;

a plurality of memory cells provided between said first and second data bus lines and connected to said row selection lines;

precharge means connected to said first and second bus lines for precharging said bus lines to an initial level every access cycle, said precharge means including resistive means tending to maintain said bus lines at said initial level;

sensing means connected to one of said bus lines for detecting read out data dependent on a change of the signal level on the bus line connected thereto;

data writing means connected to said bus lines for supplying write data to said bus lines to set the voltage level thereon to a predetermined level;

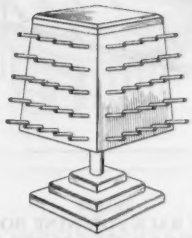
speed-up signal level changing means connected between said first and second bus lines for detecting signal level change in either bus line on the basis of a signal level difference between said bus lines and for rapidly changing the signal level on the bus lines on which a signal level change is detected to a reference signal level potential; and

switching means connected to said speed-up signal level changing means for coupling said signal level changing means to said reference signal level potential.

DESIGNS

DECEMBER 26, 1978

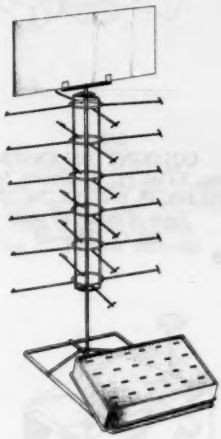
250,616
SPOOL HOLDER
Harry P. Cofer, 402 Lashley Dr., P.O. Box 141, Bonaire, Ga. 31005
Filed Mar. 28, 1977, Ser. No. 782,167
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D3—19 D



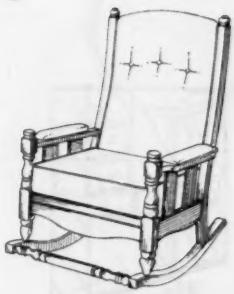
250,617
SKATE BOARD SHOE
Chrespin W. Noches, 514 Howard St., Pasadena, Calif. 91104
Filed May 17, 1977, Ser. No. 797,899
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—309

250,618
EXECUTIVE CHAIR
Sam Bivas, and Yoram Leshem, both of Willowdale, Canada, assignors to Galaxy Office Furniture Ltd., Weston, Canada
Filed Jul. 20, 1977, Ser. No. 817,474
Claims priority, application Canada, Jan. 25, 1977, 41760
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31

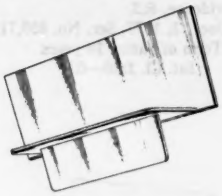
250,619
ROTATABLE FINGER RING DISPLAY STAND
Thomas A. Newman, Cranston, R.I., assignor to McGrath-Hamin, Inc., Providence, R.I.
Filed Dec. 12, 1977, Ser. No. 859,718
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—28



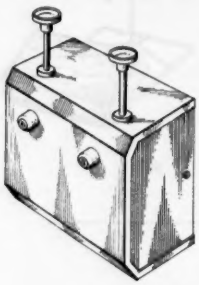
250,620
ROCKING CHAIR
Lester Beall, High Point, N.C., assignor to Trend Line Furniture Corporation, Hickory, N.C.
Filed Mar. 28, 1977, Ser. No. 782,115
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—49



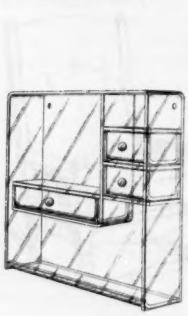
250,621
SUN GLASS HOLDER FOR DISPLAY RACK
Michael C. Blum, Los Angeles, Calif., assignor to Sunday Sunglass Corp., Glendale, Calif.
Filed Sep. 16, 1977, Ser. No. 833,728
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—85



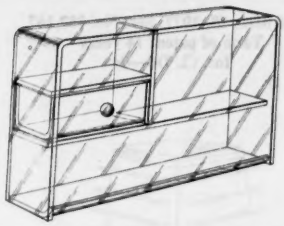
250,622
COLOGNE DISPENSER
Alexander Hunter, 5 Oak Pl., Watertown, Mass. 02172
Filed Feb. 18, 1977, Ser. No. 770,050
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



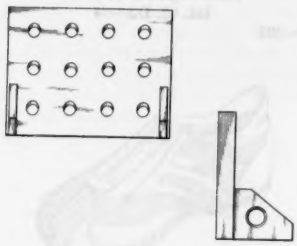
250,623
COMBINED DISPLAY AND STORAGE UNIT
Gladys Albert, 56-40 Oceania St., Bayside, N.Y. 11364, assignor to Gladys Albert
Filed Sep. 16, 1977, Ser. No. 833,659
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—129



250,624
COMBINED DISPLAY AND STORAGE UNIT
Gladys Albert, 56-40 Oceania St., Bayside, N.Y. 11364, assignor to Gladys Albert
Filed Sep. 16, 1977, Ser. No. 833,660
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—129

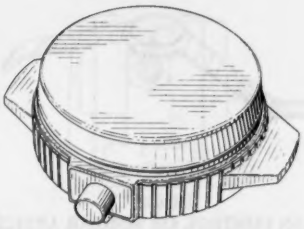


250,625
DISPLAY RACK FOR WINE BOTTLES
Harold A. Leventhal, 405 E. 56 St., New York, N.Y. 10022
Filed Mar. 14, 1977, Ser. No. 776,959
Term of patent 14 years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—188



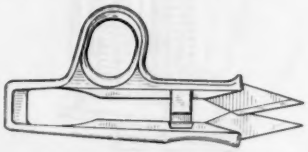
250,626
ELECTRIC COOKING UTENSIL
Robert J. Scott, Blue Springs, Mo., assignor to Rival Manufacturing Company, Kansas City, Mo.
Filed Jul. 9, 1976, Ser. No. 704,091
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—94

250,627
ELECTRIC HEATING PLATE FOR COOKWARE
Samuel L. McNair, Kansas City, and Robert R. Yeo, Independence, both of Mo., assignors to Dazey Products Co., Industrial Airport, Kans.
Filed Feb. 14, 1977, Ser. No. 768,272
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—123

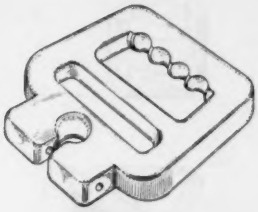


250,628
SPOON OR SIMILAR ARTICLE OF FLATWARE
Ben Seibel, New York, N.Y., assignor to Oxford Hall Silversmiths, Ltd., New York, N.Y.
Filed Aug. 18, 1976, Ser. No. 715,597
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137

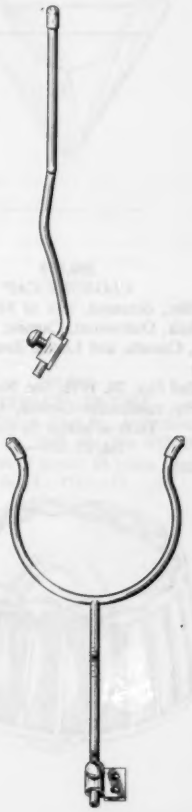
250,629
THREAD NIPPER
Olof F. Bäckström, Tammisaari, and Erkki O. Linden, Billnäs, both of Finland, assignors to Oy Fiskars AB, Helsinki, Finland
Filed Jan. 31, 1977, Ser. No. 764,141
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



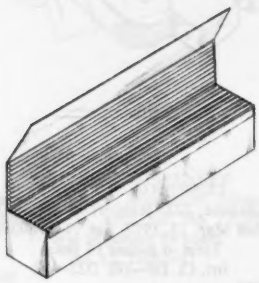
250,630
SIDE HANDLE FOR GRASS TRIMMER
Joseph B. Allegretti, 11645 Seminole Cir., Northridge, Calif. 91326
Filed Mar. 7, 1977, Ser. No. 774,860
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D8—107



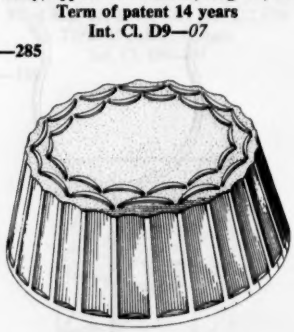
250,631
CUSPIDOR SUPPORT
Harold A. Stephenson, 2223 Ridgewood, Irving, Tex. 75062
Filed Mar. 23, 1977, Ser. No. 780,656
Term of patent 14 years
Int. Cl. D8—*08;* D23—*02*
U.S. Cl. D8—373



250,632
DISPENSING CARTON FOR DEFORMABLE FILM OR THE LIKE
Hiromitsu Takai, 2-22, Katase 4-chome, Fujisawa-shi, Kanagawa-ken, Japan
Filed Dec. 16, 1976, Ser. No. 751,356
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—235



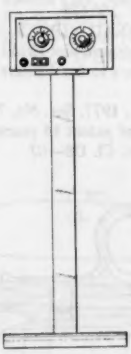
250,633
CLOSURE CAP
Ernest Bouthillier, deceased, late of Montreal, Canada; Guy Bouthillier, heir, Outremont, Canada; Paul Bouthillier, heir, Boucherville, Canada, and Louise Bouthillier, heir, St. Laurent, Canada
Filed Oct. 20, 1976, Ser. No. 734,305
Claims priority, application Canada, Aug. 18, 1976, 1808764
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—285



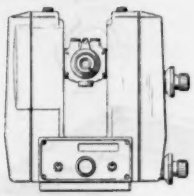
250,634
WRIST WATCH
Ferdinand A. Porsche, Zell am See, Austria, assignor to Montres Orfina S.A., Grenchen, Switzerland
Filed Oct. 15, 1976, Ser. No. 732,879
Claims priority, application Switzerland, Apr. 26, 1976, 62960/76
Term of patent 7 years
Int. Cl. D10—*02*
U.S. Cl. D10—32

250,635
FRYPAN CONTROL OR SIMILAR ARTICLE
Richard H. Carlson, Cumberland, R.I.; David P. Vieau, Attleboro, Mass., and Arthur J. Schmitt, West Bend, Wis., assignors to Texas Instruments Incorporated, Dallas, Tex. and Dart Industries, Inc., West Bend, Wis.
Filed Feb. 6, 1976, Ser. No. 655,911
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50

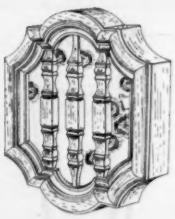
250,636
THERMOREGULATOR
John Sweet, Florence, Ky., assignor to Revlon-Realistic Professional Products, Inc., Cincinatti, Ohio
Filed Aug. 17, 1976, Ser. No. 713,186
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50



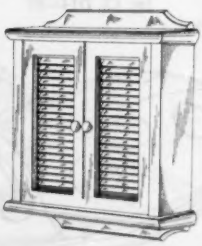
250,637
ELECTRONIC SURVEYING INSTRUMENT OR THE LIKE
J. Peter E. Kooi, Succasunna, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.
Filed Mar. 28, 1977, Ser. No. 781,901
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—66



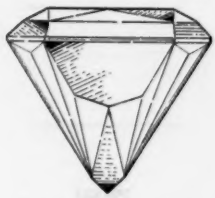
250,638
CHIME HOUSING
William B. Donnelly, Syracuse, N.Y., assignor to General Electric Company
Filed Dec. 28, 1976, Ser. No. 755,110
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—118



250,639
CHIME HOUSING
William B. Donnelly, Syracuse, N.Y., assignor to General Electric Company
Filed Dec. 28, 1976, Ser. No. 755,111
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—118

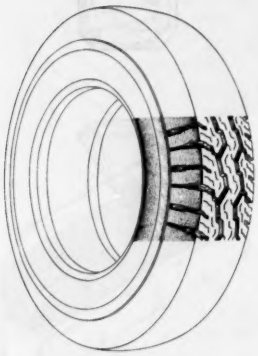


250,640
DIAMOND
Henry Grossbard, 552 Beach 132 St., Belle Harbor, N.Y. 11694
Filed Nov. 1, 1976, Ser. No. 737,896
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—90

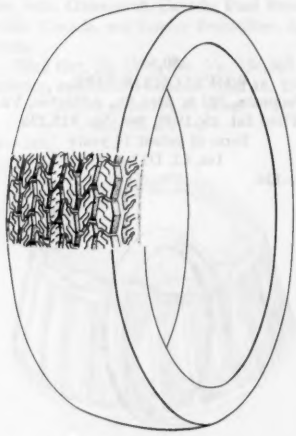


250,641
WHEELCHAIR TIRE
Andrew M. Ferguson, 703 S. 23rd St., Arlington, Va. 22202
Filed Jul. 13, 1977, Ser. No. 815,236
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—134

250,642
TIRE
Loran C. Lopp, Wadsworth; Samuel P. Landers, Uniontown, and Philip S. Hammond, Mogadore, all of Ohio, assignors to The Goodyear Tire & Rubber Company
Filed Jun. 22, 1977, Ser. No. 808,852
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



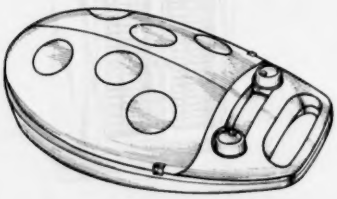
250,643
PNEUMATIC TIRE TREAD AND BUTTRESS
Allen D. Turner, Wilbraham, Mass., assignor to Uniroyal, Inc.
Filed Aug. 15, 1977, Ser. No. 824,887
Claims priority, application Canada, Aug. 2, 1977, 02-08-77-5
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—147



250,644
INSULATOR FOR AN OPEN COIL ELECTRIC HEATING UNIT
Carlisle Thweatt, Jr., Pulaski, Va., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 12, 1976, Ser. No. 731,328
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—17

250,645
HAND MICROPHONE
Donald W. Peterson, and Henry J. Cvetko, both of Conneaut, Ohio, assignors to The Astatic Corporation, Conneaut, Ohio
Filed Apr. 6, 1977, Ser. No. 785,042
Term of patent 14 years
Int. Cl. D14—*03, 01*
U.S. Cl. D14—12

250,646
PHONOGRAPH
Motohiro Hashimoto; Masahide Akiyama; Haruo Koguchi; Toshiharu Horikoshi, and Tsutomu Sakuma, all of Kawasaki, Japan, assignors to Nippon Columbia Co., Ltd., Tokyo, Japan
Filed Apr. 12, 1976, Ser. No. 675,983
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—16



250,647

TELEPHONE ACCESSORY

Carl-Arne Breger, Stockholm, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

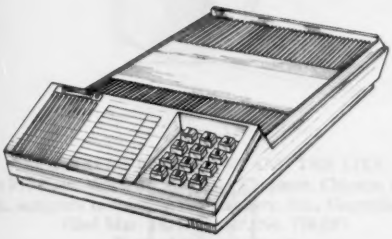
Filed Jan. 24, 1977, Ser. No. 761,711

Claims priority, application Sweden, Aug. 9, 1976, 761557

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—59



250,648

CUTTER PIN FOR MOWER

Joseph E. Scanland, Savannah, Ga., and Gerald C. Fisher, Shelby, Ohio, assignors to Roper Corporation, Kankakee, Ill.

Filed Oct. 29, 1976, Ser. No. 736,707

The portion of the term of this patent subsequent to Sep. 13, 1991, has been disclaimed.

Term of patent 14 years

Int. Cl. D15—*03*

U.S. Cl. D15—17

250,649

SEWING MACHINE

Takuo Hirano, No. 11-14, 2-chome, Meguro, Meguro-ku, Tokyo-to, Japan

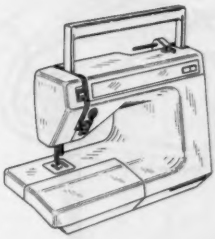
Filed Feb. 9, 1977, Ser. No. 766,979

Claims priority, application Japan, Aug. 31, 1976, 51/34352; Aug. 31, 1976, 51/34353

Term of patent 14 years

Int. Cl. D15—*06*

U.S. Cl. D15—70



250,650

PLANER BIT

George W. Swisher, Jr., Oklahoma City, Okla., assignor to CMI Corporation

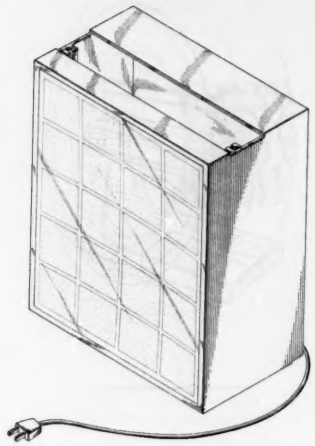
Filed Oct. 18, 1976, Ser. No. 733,454

Term of patent 14 years

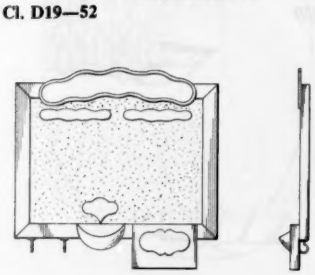
Int. Cl. D15—*09*

U.S. Cl. D15—139

250,651
TRANSPARENCY VIEWER
Bruce A. Rosenthal, 104 Macdougal St., New York, N.Y. 10012
Continuation-in-part of Ser. No. 543,345, Jan. 23, 1975, abandoned. This application Feb. 7, 1977, Ser. No. 765,958
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D16—04

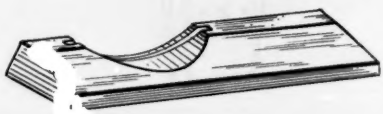


250,652
BULLETIN BOARD
Sandra Anderson, P.O. Box 345, Perryville, Md. 21903
Filed Nov. 1, 1976, Ser. No. 737,778
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—52



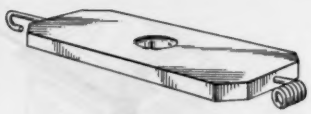
250,653
PENCIL HOLDER
Robert J. Tiedemann, Stamford, Conn., assignor to Sheller-Globe Corporation, Toledo, Ohio
Filed May 31, 1977, Ser. No. 801,828
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—85

250,654
DESK PEN SET BASE
William B. Campbell, St. Paul, Minn., assignor to Ball Corporation, Muncie, Ind.
Filed Apr. 18, 1977, Ser. No. 788,652
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—99

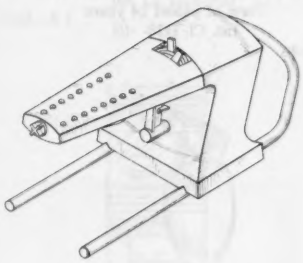


250,655
FISHING LURE
Douglas W. Parker, 2720 South Waldron Rd., Fort Smith, Ark. 72901
Filed May 9, 1977, Ser. No. 795,110
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28

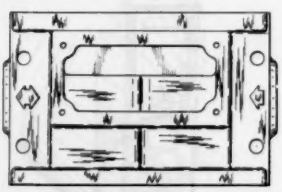
250,656
FISHING LINE RETAINER
L. Fred Raney, 506 N. Express, Paris, Ark. 72855
Filed May 9, 1977, Ser. No. 795,111
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—30



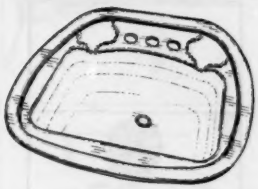
250,657
SPRINKLER FOR LAWNS AND THE LIKE
Kurt F. Mizen, Wilmette, and Dave Chapman, Chicago, both of Ill., assignors to Burgess Vibrocrafters, Inc., Grayslake, Ill.
Filed Mar. 16, 1977, Ser. No. 778,057
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—8



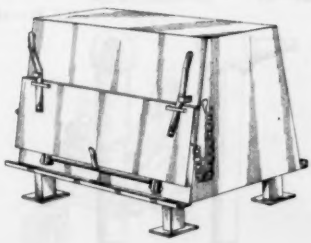
250,658
VALVE
Harold D. Fetty, Birmingham, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.
Filed May 19, 1976, Ser. No. 687,621
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—19



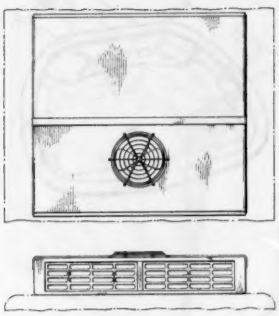
250,659
LAVATORY BOWL
Earle D. Stevenson, Boardman Township, Mahoning County, and Gary C. Staffeld, Beaver Township, Mahoning County, both of Ohio, assignors to Youngstown Sheet and Tube Company
Filed Aug. 8, 1977, Ser. No. 822,881
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—58



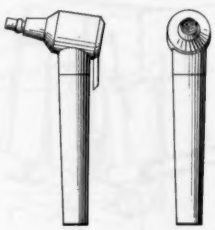
250,660
STOVE
James R. Choate, Rochester, N.H., assignor to Hydraform Products Corp., Rochester, N.H.
Filed Feb. 16, 1977, Ser. No. 769,198
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



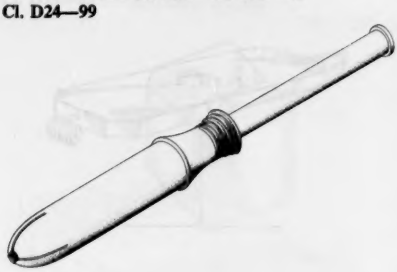
250,661
VEHICLE AIR CONDITIONER UNIT
Lowell M. Anderson, Bloomington; Ronald W. Seipp, Rosemount, both of Minn.; William A. Forsty, Export, Pa., and Rodney H. Volk, Eden Prairie, Minn., assignors to Thermo King Corporation, Minneapolis, Minn.
Filed May 16, 1977, Ser. No. 797,098
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—142



250,662
DENTAL STAIN REMOVER
Robert H. Rieselman, Clearwater, Fla., assignor to Concept, Inc., Clearwater, Fla.
Filed Apr. 18, 1977, Ser. No. 788,700
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10

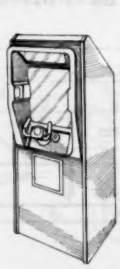


250,663
TAMPON INSERTER
John R. Koch; Mitchell J. Cohen, and Richard T. Powers, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Apr. 25, 1977, Ser. No. 790,789
Term of patent 14 years
Int. Cl. D24—*99*; D28—*01*
U.S. Cl. D24—99

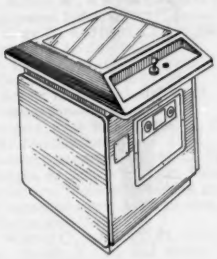


250,664
RAZOR
James B. Kruger, Oxford, and William L. Gamble, Unionville, both of Conn., assignors to Scovill Manufacturing Company, Waterbury, Conn.
Filed Apr. 27, 1977, Ser. No. 791,310
Term of patent 14 years
Int. Cl. D28- -*03*
U.S. Cl. D28—46

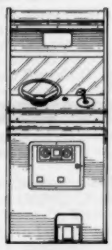
250,665
GAME CABINET
Michael L. Jang, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Feb. 16, 1977, Ser. No. 769,236
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



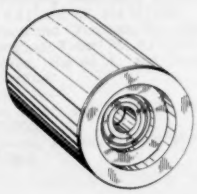
250,666
GAME CABINET
Roger D. Hector, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Feb. 16, 1977, Ser. No. 769,237
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 J



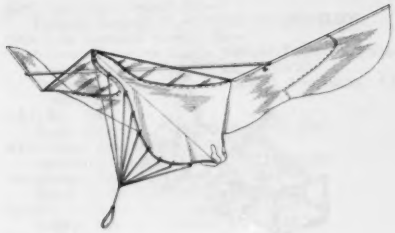
250,667
GAME CABINET
Kenneth W. Sauter, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.
Filed Aug. 29, 1977, Ser. No. 828,521
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 L



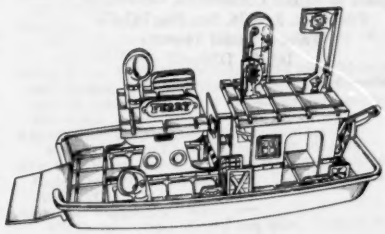
250,668
SKATE BOARD WHEEL
Albert J. Hess, 8837 Brookdale Dr., Garden Grove, Calif. 92644
Filed Oct. 28, 1976, Ser. No. 736,430
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—14 C



250,669
KITE
Benjamin J. Wilson, P.O. Box 385, Wichita Falls, Tex. 76307
Filed Sep. 27, 1976, Ser. No. 727,376
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AF



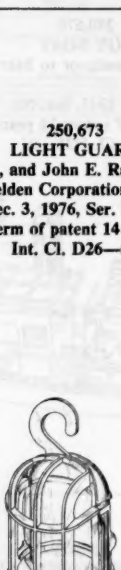
250,670
TOY BOAT
Alex Imatt, Chicago, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Jan. 21, 1977, Ser. No. 761,300
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



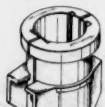
250,671
TOY MOTORCYCLE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 694,140, Jun. 9, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 899,020
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

250,672
TOY VEHICLE
Iwakichi Ogawa, Kashiwa, Japan, assignor to Takara Co., Ltd.
Continuation-in-part of Ser. No. 694,131, Jun. 9, 1976, abandoned. This application Apr. 21, 1978, Ser. No. 899,021
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ

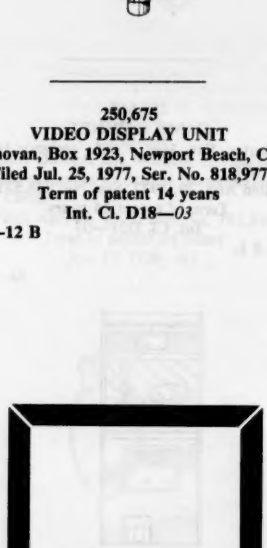
250,673
LIGHT GUARD
Kathleen G. Jennings, and John E. Rauch, both of St. Charles, Ill., assignors to Belden Corporation, Geneva, Ill.
Filed Dec. 3, 1976, Ser. No. 747,372
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 B



250,674
TROUBLE LIGHT HANDLE
Raymond L. Trueblood, New Carlisle, Ohio, assignor to Trueblood, Inc., Tipp City, Ohio
Filed May 6, 1977, Ser. No. 794,634
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—24 R



250,675
VIDEO DISPLAY UNIT
James M. Donovan, Box 1923, Newport Beach, Calif. 92663
Filed Jul. 25, 1977, Ser. No. 818,977
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B



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TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF DECEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. O. Smith Corporation: *See*—
Ryno, Robert W., 4,131,413, Cl. 431-44.000.

A.T.R. Equipment Industries Ltd.: *See*—
Plate, Gary G., 4,131,503, Cl. 156-250.000.

A. Wasserman S.p.A.: *See*—
D'Alo, Giorgio, 4,131,615, Cl. 260-347.300.

A. Y. McDonald Mfg. Co.: *See*—
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AB Carl Lamm: *See*—
Kvarnegard, Sven B., 4,131,796, Cl. 250-319.000.

AB Svenska Flaktfabriken: *See*—
Gustavsson, Lennart, 4,131,059, Cl. 98-36.000.

Abate, Giorgio, to Solai Vignola di Fabiani Orlando e C.-Societa in nome collettivo. Method of making prefabricated building components of expanded material and cement. 4,131,670, Cl. 264-256.000.

Abbott Laboratories: *See*—
Ling, Wilfred C., 4,131,011, Cl. 73-29.000.
Reddy, Reddy R. V.; and Jolley, Michael E., 4,131,798, Cl. 250-328.000.

Abbott, Stephen G.: *See*—
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Abe, Kiyotaka: *See*—
Kaneko, Koichi; Abe, Kiyotaka; and Miura, Masakazu, 4,131,531, Cl. 204-208.000.

Abe, Yoritsune: *See*—
Hara, Toshitsugu; Abe, Yoritsune; Ootuka, Katsuji; Kashiwabara, Yasushige; Oshiyama, Hiroichi; Yanadori, Michio; Kato, Eisaku; and Okazaki, Kichizaemon, 4,130,997, Cl. 62-504.000.

Abendroth, Werner, to Carl Still Recklinghausen, Firma. Coke oven construction. 4,131,421, Cl. 432-247.000.

Abhat, Ashok; and Neuer, Gunther, to Institut fur Kerntechnik und Energiewandlung e.V. Storage arrangement for thermal energy. 4,131,158, Cl. 165-104.00S.

Abitante, Peter A.: *See*—
Minar, Frank M.; and Abitante, Peter A., 4,131,328, Cl. 339-14.00R.

Abolins, Visvaldis; and Lee, Gim F., Jr., to General Electric Company. Polyphenylene ether composition. 4,131,598, Cl. 260-42.180.

Acurex Corporation: *See*—
Husome, Robert G.; Fleming, Ron J.; and Swanson, Ron E., 4,131,540, Cl. 209-582.000.

Adams, Frank H.; and Knapik, H. Peter G., to UOP Inc. Hydrocarbon conversion with a selectively sulfided acidic multimetallic catalytic composite. 4,131,536, Cl. 208-139.000.

Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Thermoplastic polycarbonate molding materials with improved mold release. 4,131,575, Cl. 260-17.40R.

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Denu, Francis, 4,130,947, Cl. 36-30.00R.

Agard, Richard L.; Bocinski, Terrence E.; Brearley, Lawrence E.; and Yaple, William R., to International Business Machines Corporation. Quick disconnect card-on-board electronic package assembly. 4,131,933, Cl. 361-415.000.

Agefko Kohlensaure-Industrie GmbH: *See*—
Chawla, Jogindar M.; von Bockh, Peter; and Dornemann, Manfred, 4,131,015, Cl. 73-199.000.

Ageno, Harris Y.: *See*—
Jeffers, William Q.; and Ageno, Harris Y., 4,131,863, Cl. 331-94.50G.

AGFA-Gevaert AG: *See*—
Engelsmann, Dieter, 4,131,353, Cl. 354-197.000.
Fauth, Gunter; and Muller, Herbert, 4,131,352, Cl. 354-86.000.
Hofmann, Wilfried; Leuder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, 4,131,348, Cl. 353-72.000.
Ludemann, Heinz; Fengler, Harald; and Schaner, Ferdinand, 4,131,041, Cl. 83-94.000.

AGFA-Gevaert, N.V.: *See*—
Van Poucke, Raphael K.; Baeyens, Freddy C.; and Mortelmans, Paul A., 4,131,735, Cl. 544-267.000.

Agrawal, Purushottam D.; and Griesing, John E., to Monsanto Company. Forming molecularly oriented containers from reheated preforms. 4,131,666, Cl. 264-521.000.

Air Products and Chemicals, Inc.: *See*—
Thorogood, Robert M., 4,131,155, Cl. 165-1.000.
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Airco, Inc.: *See*—
Blum, Peter; and Lucariello, Richard A., 4,131,530, Cl. 204-192.00C.
Tsujimoto, Kazumi N.; and McLeod, Paul S., 4,131,753, Cl. 13-31.0EB.

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Rumball, Kenneth F., 4,131,212, Cl. 215-252.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Mizuno, Kiyohumi; Maeda, Hiroaki; Takahashi, Shigeo; and Watanabe, Tsukasa, 4,131,035, Cl. 74-866.000.
Takayama, Katsuki; and Ando, Masamoto, 4,131,326, Cl. 303-115.000.

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Aktiebolaget Svenska Flaktrabriken: *See*—
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Bridges, John A., 4,131,203, Cl. 211-88.000.

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Alberts, Albert K. Means and method for mounting a structure on a shaft. 4,131,381, Cl. 403-353.000.

Albright, Larry E.: *See*—
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,131,225, Cl. 228-161.000.

Alcamo, John H. Handscrubbing device. 4,130,908, Cl. 15-21.00R.

Alcan Aluminum Corporation: *See*—
Chalmers, Alexander A.; Gailey, J. Lynn; and Wollam, Carl A., 4,130,974, Cl. 52-531.000.

Alden, John M.; and Williams, George C., to Alden Research Foundation. Cover mounted holddown for facsimile recorder cassette. 4,131,901, Cl. 346-165.000.

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Alden, John M.; and Williams, George C., 4,131,901, Cl. 346-165.000.

Aleff, Hans Peter. One way check valve construction. 4,131,135, Cl. 137-856.000.

Alexander, William M.: *See*—
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Alfter, Franz W.; Breitscheidel, Hans-Ulrich; Mecklenburg, Gunter; and Spielau, Paul, to Dynamit Nobel Aktiengesellschaft. Self-supporting molded component for automotive vehicles. 4,131,702, Cl. 428-76.000.

Algoma Steel Corporation, Limited, The: *See*—
Madill, Kenneth D., 4,130,924, Cl. 29-401.00F.

Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, to Hoffman-La Roche Inc. D-homopregnanes. 4,131,655, Cl. 260-946.000.

Align-Rite Corporation: *See*—
MacDonald, James L., Jr.; and Mink, Richard A., 4,131,472, Cl. 96-38.300.

Allen-Bradley Company: *See*—
Hart, John S., 4,131,865, Cl. 335-257.000.

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Flowers, Thomas A.; Marra, Anthony W.; and Vinch, Samuel D., 4,131,664, Cl. 264-510.000.

Allen, Paul E., to Logic Devices, Inc. Sensing system and method for plastic injection molding. 4,131,596, Cl. 264-40.500.

Allen, William B.: *See*—
Marshall, Esther L.; and Allen, William B., 4,131,327, Cl. 312-241.000.

Allied Chemical Corporation: *See*—
Cipris, Divna; and Mador, Irving L., 4,131,521, Cl. 204-59.00R.
Creasy, Walter S.; and Reimschuessel, Herbert K., 4,131,669, Cl. 264-178.00F.
MacFarlane, Robert, Jr., 4,131,591, Cl. 260-37.00N.
Radke, Donald G.; and Lewis, Donald J., 4,131,300, Cl. 280-737.000.
Sharma, Lakshmi P.; and Kurtz, Bruce E., 4,131,626, Cl. 260-658.00R.

Alltop, William O.: *See*—
Stoutmeyer, Ronald G.; and Alltop, William O., 4,131,793, Cl. 250-211.00J.

Altex Scientific, Inc.: *See*—
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Aluminum Company of America: *See*—
Dwight, Donald D., 4,131,417, Cl. 432-6.000.

Alza Corporation: *See*—
Choi, Nam S.; and Heller, Jorge, 4,131,648, Cl. 424-22.000.

Amano, Matsuo; Kobori, Sigeyuki; and Sugawara, Toru, to Hitachi, Ltd. Thermal time-delay switch. 4,131,930, Cl. 361-211.000.

Ambasz, Emilio, to Center for Design Research and Development N.V. Chair seat mount which permits the seat to tilt forward. 4,131,260, Cl. 248-384.000.

Amchem Products, Inc.: *See—*
Newhard, Nelson J., Jr., 4,131,489, Cl. 148-6.160.
Amedei, Giuseppe; Rivetti, Enrico; and Bertone, Antonino, to FIAT Societa per Azioni. Hydraulic system for feeding a plurality of independent hydraulic servo-operated devices. 4,130,990, Cl. 60-422.000.
American Cyanamid Company: *See—*
Bernstein, Seymour; and Heller, Milton D., 4,131,684, Cl. 424-315.000.
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,131,611, Cl. 260-326.800.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Gredeinskas, Charles V.; and Chen, Sow-mei C., 4,131,737, Cl. 560-121.000.
Lang, Stanley A., Jr.; Fabio, Paul F.; Lin, Yang-I; Murdock, Keith C; and Fields, Thomas L., 4,131,676, Cl. 424-248.560.
American District Telegraph Company: *See—*
Galvin, Aaron A., 4,131,888, Cl. 340-630.000.
American Greetings Corporation: *See—*
Flinn, Robert W.; and Robinson, Roy D., 4,131,415, Cl. 264-138.000.
American Locker Security Systems, Inc.: *See—*
Barth, Douglas A.; and Chester, Richard J., 4,131,191, Cl. 194-92.000.
American Monitor Corporation: *See—*
Denney, Jerry W., 4,131,425, Cl. 23-230.00B.
Denney, Jerry W., 4,131,429, Cl. 23-230.00B.
Denney, Jerry W., 4,131,430, Cl. 23-230.00B.
American Seating Company: *See—*
Knapp, Robert L.; Blodee, Leif; and Van Loo, William R., 4,131,314, Cl. 297-248.000.
AMF Incorporated: *See—*
Kaenel, Reginald A., 4,131,948, Cl. 364-900.000.
Amit, Zalman; and Ogren, Sven O., to Astra Lakemedel Aktiebolag. Method of treatment. 4,131,671, Cl. 424-244.000.
Ammons, Vernon G., to PPG Industries, Inc. Poly(ether)urethane [polyurethane] curable at ambient temperature using butylstannoic acid catalyst. 4,131,605, Cl. 528-77.000.
Ammons, Vernon G., to PPG Industries, Inc. Poly(lactone)urethane curable at [castable] ambient temperature [curable polyurethane interlayer] using butylstannoic acid catalyst. 4,131,606, Cl. 528-58.000.
AMP Incorporated: *See—*
Asick, John C.; and Huffnagle, Clifton W., 4,130,934, Cl. 29-628.000.
Hogendobler, Richard S.; and Murray, Robert M., 4,131,332, Cl. 339-177.00R.
Amsbury, Clifford R., to Rolls-Royce Limited. Displacement gauge. 4,130,941, Cl. 33-174.00L.
Amschler, Hermann; Klemm, Kurt; and Ludwig, Gerhard, to BYK Gulden Lomberg Chemische Fabrik GmbH. Urapidil/furosemide compounds, compositions and use. 4,131,678, Cl. 424-251.000.
Anderson, Charles H.: *See—*
Mezrich, Reuben S.; and Anderson, Charles H., 4,131,023, Cl. 73-606.000.
Anderson, William B., to United States of America, Navy. Slant range and direction detector. 4,131,873, Cl. 340-6.00R.
Andersson, Sven E., to Trelleborg Rubber Company, Inc. Scraper bar assembly for endless conveyor belts. 4,131,194, Cl. 198-497.000.
Ando, Masamoto: *See—*
Takayama, Katsuki; and Ando, Masamoto, 4,131,326, Cl. 303-115.000.
Andreas, Holger: *See—*
Breitenfellner, Franz; and Andreas, Holger, 4,131,595, Cl. 260-40.00R.
Andrews, Timothy D.: *See—*
Rennison, Stuart C.; Pope, John A.; and Andrews, Timothy D., 4,131,468, Cl. 96-75.000.
Angeles Metal Trim Co.: *See—*
Cable, Daniel K., 4,130,970, Cl. 52-236.300.
Angelucci, Francesco: *See—*
Penco, Sergio; Angelucci, Francesco; and Arcamone, Federico, 4,131,649, Cl. 424-180.000.
Anstadt, Gerd L.: *See—*
Kesseler, Helmut; Anstadt, Gerd L.; and Kiefer, Hermann, 4,130,976, Cl. 52-656.000.
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., to UOP Inc. Hydrocarbon dehydrogenation using nonacidic multimetallic catalyst. 4,131,628, Cl. 260-666.00A.
Aoki, Katashi. Injection blow-molding machine. 4,131,410, Cl. 425-533.000.
Aoki, Tsunetaka: *See—*
Ishii, Susumu; and Aoki, Tsunetaka, 4,130,918, Cl. 24-205.14A.
Aono, Shigeo: *See—*
Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; Manaka, Nobuzi; and Ezoe, Mituhiko, 4,131,089, Cl. 123-32.0EE.
Aoyagi, Yoshinobu: *See—*
Namba, Susumu; and Aoyagi, Yoshinobu, 4,131,506, Cl. 156-643.000.
Applied Radiation Corporation: *See—*
Stieber, Volker A. W., 4,131,799, Cl. 250-385.000.
Apsit, Voldemar V.; Sika, Zigurd K.; and Kurkalov, Ivan I., to Fiziko-Energeticheskiy Institut Akademii Nauk Latviiskoi SSR. Traction means with electrodynamic vehicle suspension for high-speed land transport. 4,131,811, Cl. 310-12.000.
Arakawa, Kazuo: *See—*
Koyama, Masateru; and Arakawa, Kazuo, 4,131,843, Cl. 323-9.000.
Araki, Masakatsu; Ochi, Shuhei; Kusunoki, Toshio; Ishii, Teizi; and Sakata, Shinichi, to Matsushita Electric Works, Ltd. Method and device for setting curls in hair. 4,131,121, Cl. 132-7.000.
Arbib, Philip B.: *See—*
Sheppard, Stewart A.; Arbib, Philip B.; and Pert, Maurice R., 4,130,912, Cl. 15-210.00R.
Arcamone, Federico: *See—*
Penco, Sergio; Angelucci, Francesco; and Arcamone, Federico, 4,131,649, Cl. 424-180.000.
Archibald, John L.; and Jackson, John L., to John Wyeth & Brother Ltd. Hypotensive sulphonamidopiperidyl indoles. 4,131,680, Cl. 424-267.000.
Arco Industries Corporation: *See—*
Demrick, Carl J., 4,130,933, Cl. 29-564.000.
Arcos Corporation: *See—*
Norcross, James E., 4,130,931, Cl. 29-527.500.
Arizona Chemical Company: *See—*
Wojcik, Ronald T., 4,131,567, Cl. 252-435.000.
Arkla Industries, Inc.: *See—*
Epmeier, Robert T., 4,130,932, Cl. 29-523.000.
Arlt, Dieter: *See—*
Radlmann, Eduard; Reinehr, Ulrich; Hoffmann, Peter; Arlt, Dieter; and Nischk, Gunther, 4,131,724, Cl. 526-16.000.
Armstrong Cork Company: *See—*
Lewicki, Walter J., Jr., 4,131,663, Cl. 264-40.200.
Armstrong, Philip N. Random access digital sorter. 4,131,947, Cl. 364-900.000.
Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., to United States of America, Air Force. 4,4'-Bis(3-ethynylphenoxy)-diphenylsulfone. 4,131,625, Cl. 260-607.0AR.
Arnold, Fred E.; and Wolfe, James F., to United States of America, Air Force. P-Terphenylene-dicarboxylic acids and their synthesis. 4,131,748, Cl. 562-488.000.
Aryamane, Avinash: *See—*
Schmidt, John, Jr.; and Aryamane, Avinash, 4,131,869, Cl. 337-264.000.
Asahi Glass Company Limited: *See—*
Ojiri, Kozo; and Sakai, Kohzo, 4,131,539, Cl. 209-127.00A.
Asahi, Hiroji, to Tokyo Shibaura Electric Co., Ltd. High speed complementary MOS memory. 4,131,951, Cl. 365-203.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Hagiwara, Teruo, 4,131,354, Cl. 354-224.000.
Asano, Masaharu; and Manaka, Nobuzi, to Nissan Motor Company, Ltd. Variable gain closed-loop control apparatus for internal combustion engines. 4,131,091, Cl. 123-32.0EH.
Asano, Masaharu: *See—*
Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; Manaka, Nobuzi; and Ezoe, Mituhiko, 4,131,089, Cl. 123-32.0EE.
ASEA Aktiebolag: *See—*
Isaksson, Sven-Erik, 4,131,419, Cl. 432-205.000.
Lundstrom, Jan-Erik, 4,131,883, Cl. 340-324.0AD.
Ashitaka, Hidetomo: *See—*
Nagasaka, Akira; Ashitaka, Hidetomo; Kusuki, Yoshihiro; Oda, Denichi; and Yoshinaga, Toshimune, 4,131,644, Cl. 423-447.500.
Asick, John C.; and Huffnagle, Clifton W., to AMP Incorporated. Method for terminating high density cable. 4,130,934, Cl. 29-628.000.
Association pour la Recherches et le Developpement des Methodes et Processus Industriels: *See—*
Randon, Jean-Louis R. G.; and Slama, Georges S., 4,131,697, Cl. 427-249.000.
Astra Lakemedel Aktiebolag: *See—*
Amit, Zalman; and Ogren, Sven O., 4,131,671, Cl. 424-244.000.
Astrom, Karl P. E.: *See—*
Olsson, Knut A. G.; Astrom, Karl P. E.; and Johansson, Johan C., 4,131,546, Cl. 210-77.000.
Attwood, Terence E., to Imperial Chemical Industries Limited. Coating process using dispersions of tetrafluoroethylene polymers and polyethersulphones and article. 4,131,711, Cl. 428-332.000.
Audeh, Costandi A., to Mobil Oil Corporation. Iminodiimides of 3,3',4,4'-benzophenonetetracarboxylic dianhydride and compositions thereof. 4,131,610, Cl. 260-326.00N.
Aulich, Hubert; and Grabmaier, Josef, to Siemens Aktiengesellschaft. Crucible for the production of single-material light-guiding fibers. 4,131,447, Cl. 65-325.000.
Aureli, William D., to Scovill Manufacturing Company. Apparatus for gapping a slide fastener. 4,131,223, Cl. 225-94.000.
Aurell, Eskill, to Aktiebolaget Svenska Flaktrabriken. Quick-connect-and-disconnect assembly. 4,131,440, Cl. 55-302.000.
Austin, James; and Clemson, Daniel, to Data General Corporation. Line power cord adaptor. 4,131,805, Cl. 307-147.000.
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for producing large-size, self-supporting plates of silicon. 4,131,659, Cl. 264-25.000.
Autotronic Controls, Corp.: *See—*
Merrick, James W., 4,131,100, Cl. 123-148.00E.
Avershin, Vasily T.: *See—*
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,131,184, Cl. 192-3.260.
Avins, Jeremiah Y.: *See—*
Mezrich, Reuben S.; and Avins, Jeremiah Y., 4,131,025, Cl. 73-606.000.
Avon Tyres Limited: *See—*
Wilde, Michael A.; and Lucas, David J., 4,131,500, Cl. 156-131.000.

Ayerst, McKenna & Harrison, Ltd.: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippman, Wilbur; and Pugsley, Thomas A., 4,131,745, Cl. 560-252.000.
Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A.: *See*—
Silvestrini, Bruno, 4,131,675, Cl. 424-250.000.
B. F. Goodrich Company, The: *See*—
Babbin, William R., 4,131,409, Cl. 425-445.000.
Herman, Richard M.; and Batiuk, Martin, 4,131,654, Cl. 260-897.00B.
B & W Manufacturing Co., Inc.: *See*—
Boser, Ronald J., 4,131,077, Cl. 112-265.000.
Baars, Nicolaas J., to U.S. Philips Corporation. Symmetrical arrangement for forming a variable alternating-current resistance. 4,131,809, Cl. 307-303.000.
Babbin, William R., to B. F. Goodrich Company, The. Apparatus for vulcanizing hose. 4,131,409, Cl. 425-445.000.
Babcock & Wilcox Company, The: *See*—
McDonald, Bertrand N., 4,131,085, Cl. 122-382.000.
Babin, Charles E.: *See*—
Rousseau, John F., Jr.; and Babin, Charles E., 4,131,079, Cl. 116-22.00A.
Back, Walter, to Bopp & Reuther GmbH. Vane type meter. 4,131,017, Cl. 73-229.000.
Baeyens, Freddy C.: *See*—
Van Poucke, Raphael K.; Baeyens, Freddy C.; and Mortelmans, Paul A., 4,131,735, Cl. 544-267.000.
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, to Steag Kernenergie G.m.b.H. Process of preparing substantially solid waste containing radioactive or toxic substances for safe, non-pollutive handling, transportation and permanent storage. 4,131,563, Cl. 252-301.10W.
Bailey, James R.; and Lavigne, Vernon W., to Switchcraft, Inc. Push-button electrical switches and pushbuttons therefor. 4,131,777, Cl. 200-311.000.
Bailey, John; Randell, Michael J.; and Sherrington, Paul R., to Procter & Gamble Company, The. Process for preparing an orthophosphate-silicate detergent product. 4,131,558, Cl. 252-135.000.
Bailey, William L.: *See*—
Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., 4,131,755, Cl. 136-89.00P.
Bainard, Dean R., to Garlock Inc. Seal and method for attaching seal. 4,131,286, Cl. 277-152.000.
Bairunas, Robert A.: *See*—
Gusmer, Frederick E.; Commette, Denis S.; and Bairunas, Robert A., 4,131,395, Cl. 417-271.000.
Baker, Charles M.: *See*—
Foster, Gene B.; and Baker, Charles M., 4,131,003, Cl. 72-7.000.
Bakos, Peter; and Rasile, John, to International Business Machines Corporation. Method of making metal filled via holes in ceramic circuit boards. 4,131,516, Cl. 204-15.000.
Ball Corporation: *See*—
Marcantonio, Arnold F., 4,131,552, Cl. 252-29.000.
Munson, Robert E.; Sanford, Gary G.; and Murphy, Lawrence R., 4,131,892, Cl. 343-700.0MS.
Munson, Robert E.; and Sanford, Gary G., 4,131,893, Cl. 343-700.0MS.
Schiavone, Frank J., 4,131,894, Cl. 343-700.0MS.
Ball, George A., Jr.; and Simpson, George H., to GTE Sylvania Incorporated. Electric automotive choke. 4,131,657, Cl. 261-39.00E.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See*—
Dammann, Peter; Schippers, Heinz; Turk, Herbert; and Schiminski, Herbert, 4,130,983, Cl. 57-5.000.
Barnes-Hind Pharmaceuticals, Inc.: *See*—
Shah, Dinesh O.; and Sibley, Murray J., 4,131,651, Cl. 424-78.000.
Barr, Robert H.; and Eckel, John D., to A. Y. McDonald Mfg. Co. Safety valve for fuel dispensers including vapor recovery systems. 4,131,142, Cl. 141-302.000.
Barry, Edward J., to International Paper Company. Bottom for bulk bins. 4,131,228, Cl. 229-23.00R.
Barta, Leslie P.; and Alexander, William M., to Alexander, William M. Leather yarn product and method of manufacture. 4,131,713, Cl. 428-364.000.
Barth, Douglas A.; and Chester, Richard J., to American Locker Security Systems, Inc. Coin operated lock. 4,131,191, Cl. 194-92.000.
Bartish, Charles M. Catalytic synthesis of low molecular weight hydrocarbons. 4,131,568, Cl. 252-455.00Z.
Bartlett, John S.; and Hudson, Barry, to BP Chemicals Limited. Cobalt-catalyzed oxidation of C_3 to C_7 saturated aliphatic hydrocarbons to oxygenated products. 4,131,741, Cl. 560-241.000.
Bartley, Francis A.: *See*—
Goodbary, Edgar R.; and Bartley, Francis A., 4,131,177, Cl. 180-133.000.
Bartoo, Vance S.: *See*—
Milgram, Jerome H.; Bartoo, Vance S.; and O'Connor, Burdett H., 4,131,397, Cl. 417-404.000.
Barzda, Justin J., to United States of America, Navy. Deployable rotor. 4,131,392, Cl. 416-142.000.
BASF Aktiengesellschaft: *See*—
Blankenmeister, Anton; Peinecke, Ludwig; and Koob, Dieter, 4,131,197, Cl. 206-387.000.
Hamprecht, Gerhard, 4,131,620, Cl. 260-543.00R.
Koenig, Karl-Heinz; Schirmer, Ulrich; Wuerzer, Bruno; and Fett, Kurt, 4,131,751, Cl. 560-29.000.
Martiny, Wolfgang; and MacGillavry, Donald H., 4,131,851, Cl. 325-355.000.
Osterloh, Rolf; Jacobi, Manfred; and Kuesters, Werner, 4,131,529, Cl. 204-159.140.
von Kutepow, Nikolaus; Mueller, Franz J.; and Reuter, Peter, 4,131,640, Cl. 423-22.000.
Bass Handler Products Co., Inc.: *See*—
Fontenot, Carl E., 4,130,960, Cl. 43-18.00R.
Bass, Jerry D., to Westinghouse Electric Corp. Speed pattern generator. 4,131,182, Cl. 187-29.00G.
Batiuk, Martin: *See*—
Herman, Richard M.; and Batiuk, Martin, 4,131,654, Cl. 260-897.00B.
Battle, Francis L., to Gulf & Western Industries, Inc. Digital loop detector with automatic tuning. 4,131,848, Cl. 324-236.000.
Bauder, Edward M. Andiron for supporting logs. 4,131,108, Cl. 126-298.000.
Bauer Bros. Co., The: *See*—
Skeen, Lawrence, 4,131,061, Cl. 99-521.000.
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., to Clark Equipment Company. Method of making a vehicle transmission case. 4,131,225, Cl. 228-161.000.
Baumgartner, Erich R.; and Doehler, Peter. Pressing or smoothing iron comprising a safety turn-off means located in a heating current circuit. 4,130,955, Cl. 38-82.000.
Baxter, Clement T.: *See*—
Dombrowski, Joseph A.; Baxter, Clement T.; Howard, Frederick B.; and Simpson, George H., 4,131,868, Cl. 337-113.000.
Baxter Travenol Laboratories, Inc.: *See*—
Range, Richard J., 4,131,426, Cl. 141-1.000.
Bayer Aktiengesellschaft: *See*—
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; and Nouvertne, Werner, 4,131,575, Cl. 260-17.40R.
Perrey, Hermann; Matner, Martin; and Sinn, Gustav, 4,131,603, Cl. 528-45.000.
Radlmann, Eduard; Reinehr, Ulrich; Hoffmann, Peter; Arlt, Dieter; and Nischk, Gunther, 4,131,724, Cl. 526-16.000.
Bayley, Donald S., to Singer Company, The. Fused silica nuclear magnetic resonance and filter cells with stabilized vapor densities. 4,131,443, Cl. 65-17.000.
Bayliss, John P., to Girling Limited. Electrically controlled fluid brake system. 4,131,325, Cl. 303-93.000.
Bazzle, Lillian M.; and Staton, Marshall J., to Bazzle, Lillian Mae. Shoe including golf ball position marker. 4,130,950, Cl. 36-127.000.
Bazzle, Lillian Mae: *See*—
Bazzle, Lillian M.; and Staton, Marshall J., 4,130,950, Cl. 36-127.000.
BBC Brown, Boveri & Company, Limited: *See*—
Menth, Anton; Nagel, Hartmut; and Spinner, Ulrich, 4,131,495, Cl. 148-31.570.
Beasley, Matthew D.: *See*—
Maham, Robert M.; and Beasley, Matthew D., 4,131,773, Cl. 200-61.050.
Beatrice Foods Company: *See*—
Lai, Kwo-Hrong; and Silvers, Harold N., 4,131,731, Cl. 528-370.000.
Bechtel International Corporation: *See*—
Leonard, Byron H., Jr., 4,131,302, Cl. 285-114.000.
Becker, Harry; Doerflinger, Karl; Ey, Klaus; Reiter, Georg; Rutzmoser, Hermann; and Theus, Richard, to Siemens Aktiengesellschaft. Receptacle fixture for equipment units in electrical communication technology. 4,131,934, Cl. 361-428.000.
Beckmann, Karen L.: *See*—
Long, Wesley A., 4,131,159, Cl. 165-166.000.
Becton, Dickinson Electronics Company: *See*—
Erickson, Richard W.; Pallaske, James; and Talbert, Stephen (said Richard Erickson and James Pallaske assors. to), 4,131,771, Cl. 200-11.0DA.
Beerens, Cornelis J. Guide device for sharpening saws. 4,131,038, Cl. 76-25.00A.
Behr, Michael I.; Gyi, Ko K.; Iwan, Wilfred D.; and Palotay, Joseph C., to Burroughs Corporation. Flexure mounted magnetic head positioner for high-speed translation. 4,131,924, Cl. 360-106.000.
Beisch, Hans R.; and Hempelmann, Heinrich J., to Norris Industries, Inc. Wheel trim retention. 4,131,322, Cl. 301-37.0PB.
Bell & Howell Company: *See*—
Patton, Donna J.; and Riess, Robert G., 4,131,227, Cl. 229-8.000.
Bell, Jimmy T.: *See*—
Friedman, Horace A.; Toth, Louis M.; and Bell, Jimmy T., 4,131,527, Cl. 204-157.10R.
Bell Telephone Laboratories, Incorporated: *See*—
Christensen, Susan W.; and Coker, Cecil H., 4,131,760, Cl. 179-1.00P.
Hartman, Adrian R.; North, James C.; Reutlinger, George W.; and Shackle, Peter W., 4,131,910, Cl. 357-49.000.
Reid, Anthony, 4,131,762, Cl. 179-15.0AQ.
Weinstein, Stephen B., 4,131,767, Cl. 179-170.200.
Bendix Corporation, The: *See*—
Erwin, Louis R., 4,131,055, Cl. 91-378.000.
Reddy, Junuthula N., 4,131,088, Cl. 123-32.0EJ.
Bengtsson, Ralph; and Larsson, Gunnar, to C J Wennberg AB. Process and an apparatus for the continuous mechanical fabrication of starting sheets for the electrolytic refining of metals, especially copper. 4,130,927, Cl. 29-432.100.
Bennefeld, David H., to Introl Corp. Battery charger with automatic change from current to voltage mode control. 4,131,841, Cl. 320-23.000.

Berger, James K., to Pioneer Magnetics. Closed-clock writing system for a rotating magnetic memory. 4,131,920, Cl. 360-51.000.
Berglund, David B., to E-Systems, Inc. Optical range resolution system. 4,131,248, Cl. 244-3.160.
Bergna, Horacio E.; and Kirkland, Joseph J., to Du Pont de Nemours, E. I., and Company. Spray dried silica for chromatography. 4,131,542, Cl. 210-31.00C.
Bernard, Walter J.; and Szpak, Stanley P., to Sprague Electric Company. Two-stage anodization of capacitor electrodes. 4,131,520, Cl. 204-42.000.
Berney, Jean-Claude: *See—*
Scherrer, Igor; Berney, Jean-Claude; and Robert-Grandpierre, Jean-Claude, 4,130,988, Cl. 58-85.500.
Bernstein, Philip; Coffey, James P.; and Varker, Alan E., to ESB Incorporated. Grafted polymeric material and process for preparing. 4,131,637, Cl. 260-877.000.
Bernstein, Seymour; and Heller, Milton D., to American Cyanamid Company. Complement inhibitors. 4,131,684, Cl. 424-315.000.
Berry, David: *See—*
Redmayne, William H.; and Berry, David, 4,131,545, Cl. 210-47.000.
Bertazzoli, Guido; Gironi, Roberto; and Resentini, Angelo, to Industrie Pirelli S.p.A. Pneumatic tire for agricultural and industrial vehicles. 4,131,148, Cl. 152-209.00B.
BERTIN & Cie: *See—*
Volat, Jean-Pierre; and Pichon, Jean-Louis E., 4,131,320, Cl. 302-2.00R.
Bertone, Antonino: *See—*
Amedei, Giuseppe; Rivetti, Enrico; and Bertone, Antonino, 4,130,990, Cl. 60-422.000.
Bertozzi, Eugene R., to Thiokol Corporation. Acrylic acid esters of polythiodialkanols and related compounds. 4,131,716, Cl. 428-425.000.
Bethlehem Steel Corporation: *See—*
Clymer, John C., 4,131,857, Cl. 328-163.000.
Bezzerides, Paul A. Stubble eradicating implement. 4,131,163, Cl. 172-145.000.
Bialko, Joseph A.; and Lechaton, John S., to International Business Machines Corporation. RF sputtering apparatus having floating anode shield. 4,131,533, Cl. 204-298.000.
Bib Hi-Fi Accessories Limited: *See—*
Sheppard, Stewart A.; Arbib, Philip B.; and Pert, Maurice R., 4,130,912, Cl. 15-210.00R.
Bigelow, John H., to Du Pont de Nemours, E. I., and Company. 4,7-Dihydroxybenzimidazole hydrobromide as antifogger. 4,131,467, Cl. 96-66.300.
Binckley, Earle T. Helicopter blade ice protection systems. 4,131,250, Cl. 244-134.00R.
Binger, Bernhard: *See—*
Eickhoff, Jurgen; and Binger, Bernhard, 4,131,169, Cl. 180-9.620.
Birkenhead, Warren D. Intrusion alarm system utilizing the barking of a watchdog. 4,131,887, Cl. 340-566.000.
Bischeltsrieder, Lorenz, to Stubben GmbH, Riding Equipment. Saddle tree for riding saddles. 4,130,979, Cl. 54-44.000.
Bitterlich, Eberhard; Thelen, Franz; and Weber, Henning, to Deutsche Babcock Aktiengesellschaft. Arrangement for the storage of energy in power plants. 4,130,992, Cl. 60-652.000.
BJR Machine & Gear: *See—*
Easton, Ray D.; Jakobi, Phil F.; and Zabik, Andrew L., 4,130,967, Cl. 51-5.00D.
Black, Paul G.: *See—*
Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., 4,131,054, Cl. 90-11.00D.
Black, Stanley H.; and Schneider, Jon A., to Sperry Rand Corporation. Phase lock loop with narrow band lock-in and wideband acquisition characteristics. 4,131,862, Cl. 331-4.000.
Blackburn, Samuel S., Jr.; and Hammer, George P., to Combustion Engineering, Inc. Boiler fan arrangement. 4,131,073, Cl. 110-106.000.
Blaha, John F.: *See—*
Schriber, Louis; and Blaha, John F., 4,131,047, Cl. 83-698.000.
Blankenmeister, Anton; Peinecke, Ludwig; and Koob, Dieter, to BASF Aktiengesellschaft. Container for a cassette containing a recording tape, particularly for a magnetic-tape cassette. 4,131,197, Cl. 206-387.000.
Blasutti, Claudine. Ultrasonic cigarette-holder or pipe stem. 4,131,119, Cl. 131-187.000.
Blaszkowski, Henry. Windshield wiper control system. 4,131,834, Cl. 318-483.000.
Blaw-Knox Foundry & Mill Machinery, Inc.: *See—*
Eibe, Werner W., 4,131,004, Cl. 72-8.000.
Bleicher, Manfred: *See—*
Wanner, Karl; Bleicher, Manfred; and Falchle, Jorg, 4,131,165, Cl. 173-48.000.
Blodee, Leif: *See—*
Knapp, Robert L.; Blodee, Leif; and Van Loo, William R., 4,131,314, Cl. 297-248.000.
Bluethgen, Waldemar; Broemer, Heinz; and Deutscher, Klaus K., to Ernst Leitz GmbH. Bioactive composite material process of producing and method of using same. 4,131,597, Cl. 260-42.180.
Blum, Peter; and Lucariello, Richard A., to Airco, Inc. Sputtered chromium-alloy coating for plastic. 4,131,530, Cl. 204-192.00C.
Board of Supervisors of Louisiana State University and Agricultural & Mechanical College: *See—*
Meyers, Albert I., 4,131,623, Cl. 260-601.00R.
Boatright, Paul A., to Oceanography International Corporation. Solid piezoelectric sand detection probes. 4,131,815, Cl. 310-323.000.
Bochenek, Michael S.; and Boyer, Bradley X., to Bochenek, Michael S. Drapery opening and closing system. 4,131,831, Cl. 318-282.000.
Bocinski, Terrence E.: *See—*
Agard, Richard L.; Bocinski, Terrence E.; Brearley, Lawrence E.; and Yaple, William R., 4,131,933, Cl. 361-415.000.
Bock, Harald: *See—*
Hultsch, Gunther; and Bock, Harald, 4,130,944, Cl. 34-8.000.
Bode, Charles H., Jr.; Saggio, Anthony S.; Wagner, George J., Jr.; and Wessel, Richard L., to United States Steel Corporation. Pour tube manipulator for sliding gate valve. 4,131,220, Cl. 222-607.000.
Bode, Hugo B.: *See—*
Mackenroth, Joseph R., III; and Bode, Hugo B., 4,130,902, Cl. 2-7.000.
Bodson, Luc; Obsomer, Marc; and Michel, Edmond, to SOLVAY & Cie. Process for mould release of hollow plastic bodies moulded by blowing by means of a nozzle. 4,131,665, Cl. 264-572.000.
Boeing Company, The: *See—*
Dean, Roy D.; and Weiland, Richard H., 4,131,252, Cl. 244-212.000.
Foster, Gene B.; and Baker, Charles M., 4,131,003, Cl. 72-7.000.
Whetham, William J., 4,131,837, Cl. 318-571.000.
Zapel, Edwin J., 4,131,253, Cl. 244-219.000.
Boersma, Richard F., to Fiat-Allis Construction Machinery, Inc. Instrument panel cover for vandalism protection. 4,131,173, Cl. 180-90.000.
Boerwinkle, Fred P., to Northern Instruments Corporation. Corrosion inhibiting compositions. 4,131,583, Cl. 260-29.6HN.
Boisvert, Guy. Hand weaving loom. 4,131,138, Cl. 139-29.000.
Bollmer, Jacob A., to Dayco Corporation. Printing blanket hole forming apparatus and method. 4,131,040, Cl. 83-50.000.
Bom, Cornelis J. G.: *See—*
van der Lely, Ary; and Bom, Cornelis J. G., 4,131,237, Cl. 239-664.000.
Boorman, Robert W.: *See—*
Perrone, George L.; Boorman, Robert W.; Holbrook, Michael R.; and Zanelli, Eugene A., 4,131,389, Cl. 415-211.000.
Bopp & Reuther GmbH: *See—*
Back, Walter, 4,131,017, Cl. 73-229.000.
Borg-Warner Corporation: *See—*
Ivey, John S.; and Miller, Alan L., 4,131,036, Cl. 74-866.000.
Smith, Grant H.; and Carlson, Ronald L., 4,131,187, Cl. 192-99.00A.
Borg-Warner Limited: *See—*
Warland, George W.; and Crisp, Norman F., 4,131,032, Cl. 74-449.000.
Borsuk, Pavel A.: *See—*
Kagan, Naum Y.; Bortnik, Vladimir M.; Korenbljum, Isai V.; Razumeev, Jury A.; Lyass, Abram M.; Borsuk, Pavel A.; Usubov, Zokhrab G. O.; and Dmitrieva, Valentina A., 4,131,477, Cl. 106-38.350.
Bortnik, Vladimir M.: *See—*
Kagan, Naum Y.; Bortnik, Vladimir M.; Korenbljum, Isai V.; Razumeev, Jury A.; Lyass, Abram M.; Borsuk, Pavel A.; Usubov, Zokhrab G. O.; and Dmitrieva, Valentina A., 4,131,477, Cl. 106-38.350.
Bosch-Siemens Hausgerate GmbH: *See—*
Rolf, Mayer, 4,131,034, Cl. 74-799.000.
Boser, Ronald J., to B & W Manufacturing Co., Inc. Method of attaching a slide fastener to an article. 4,131,077, Cl. 112-265.000.
Bottcher, Hubert; Pfannmuller, Joachim; Kaebernick, Hartmut; Steiniger, Wolfgang; and Preuss, Horst-Dieter, to Hauni-Werke Korber & Co. KG. Method and apparatus for splicing running webs of low tensile strength. 4,131,501, Cl. 156-157.000.
Bouyoucos, John V., to Hydroacoustics, Inc. Seismic source for use under water. 4,131,178, Cl. 181-120.000.
Bowers, John W., to Foseco International Limited. Device for retaining hot top lining slabs. 4,131,262, Cl. 249-202.000.
Boyd, David G.: *See—*
Denton, Dennis N.; and Boyd, David G., 4,131,285, Cl. 277-1.000.
Boyer, Bradley X.: *See—*
Bochenek, Michael S.; and Boyer, Bradley X., 4,131,831, Cl. 318-282.000.
Boyer, Robert C.: *See—*
Williams, George J.; and Boyer, Robert C., 4,131,270, Cl. 269-321.00W.
Boyer, Robin L.; Lazarus, Sonja E.; and Buck, F. O., Jr. Board game apparatus. 4,131,282, Cl. 273-271.000.
BP Chemicals Limited: *See—*
Bartlett, John S.; and Hudson, Barry, 4,131,741, Cl. 560-241.000.
Hudson, Barry, 4,131,742, Cl. 560-241.000.
Brachthauser, Kunibert, to Klockner-Humboldt-Deutz Aktiengesellschaft. Method for the production of fine-grained mixture of mineral solids. 4,130,945, Cl. 34-10.000.
Braden, Arthur B.; McBride, Thomas R.; Styblo, Donald J.; Taylor, Samuel K.; and Richey, Joseph B., to Ohio-Nuclear, Inc. Automatic patient table having means for transporting patient along a table. 4,131,802, Cl. 250-445.00T.
Bradley, James B., Jr. Ophthalmic device. 4,131,341, Cl. 351-132.000.
Bradley, James B., Jr. Ophthalmic mold device. 4,131,401, Cl. 425-2.000.
Brandhorst, Henry W., Jr., to United States of America, National Aeronautics and Space Administration. Back wall solar cell. 4,131,486, Cl. 136-89.0SJ.
Brandt, Jurgen: *See—*
Erb, Hans Joachim; Brandt, Jurgen; and Kirschbaum, Peter, 4,131,900, Cl. 346-162.000.

Branton, Tom W., to RCA Corporation. Cathode ray tube with stress-relieved slot-aperture shadow mask. 4,131,822, Cl. 313-403.000.

Brattrud, Hans. Device for protection of vehicle windows against ice or frost. 4,131,269, Cl. 296-95.00Q.

Braumer, Klaus; and Eckmayer, Zdenek, to Carl Freudenberg, Firma. Collagen foil for cosmetic application. 4,131,650, Cl. 424-28.000.

Braunschweigische Maschinenbauanstalt: *See*—
Dietzel, Walter, 4,131,482, Cl. 127-19.000.

Brauticam, Rolf: *See*—
Weckenmann, Albert; Brauticam, Rolf; and Haas, Lothar, 4,131,772, Cl. 200-61.540.

Brearley, Lawrence E.: *See*—
Agard, Richard L.; Bocinski, Terrence E.; Brearley, Lawrence E.; and Yaple, William R., 4,131,933, Cl. 361-415.000.

Bregg, Gary N.: *See*—
Coxon, DeWayne; and Bregg, Gary N., 4,131,109, Cl. 126-270.000.

Breitenfellner, Franz; and Andreas, Holger, to Ciba-Geigy Corporation. Thermoplastic moulding compositions. 4,131,595, Cl. 260-40.00R.

Breiter, Manfred W.; Chatterji, Debajyoti; King, Randall N.; and Park, Dong-Sil, to Electric Power Research Institute, Inc. Sulfur electrode container construction and method of manufacture. 4,131,226, Cl. 228-198.000.

Breitscheidel, Hans-Ulrich: *See*—
Alfter, Franz W.; Breitscheidel, Hans-Ulrich; Mecklenburg, Gunter; and Spielau, Paul, 4,131,702, Cl. 428-76.000.

Brendley, William H., Jr., to Rohm and Haas Company. Powder coatings containing copolymer containing isobornyl methacrylate as melt flow modifier. 4,131,572, Cl. 260-17.00R.

Brenner, Douglas, to Exxon Research & Engineering Co. Plasticization of neutralized sulfonated elastomeric polymer. 4,131,587, Cl. 260-32.60A.

Bricmont & Associates, Inc.: *See*—
Bricmont, Francis H., 4,131,914, Cl. 358-100.000.

Bricmont, Francis H., to Bricmont & Associates, Inc. Method and apparatus for inspecting refractory lining in coke oven chambers and the like. 4,131,914, Cl. 358-100.000.

Bridges, John A., to Aladdin Industries, Incorporated. Wall mounted modular units. 4,131,203, Cl. 211-88.000.

Bridgestone Tire Company Limited: *See*—
Hashimoto, Mitsuo; and Koguchi, Mitsuo, 4,131,347, Cl. 353-28.000.

British Hovercraft Corporation Ltd.: *See*—
Wheeler, Raymond L., 4,131,175, Cl. 180-127.000.

British Hydromechanics Research Association, The: *See*—
Saunders, David H., 4,131,236, Cl. 239-589.000.

British Industrial Plastics Ltd.: *See*—
Isherwood, Harold; and Shaw, John T., 4,131,574, Cl. 260-17.300.

British Petroleum Company Limited, The: *See*—
Drake, Paul H.; Humphris, Colin J.; and Preedy, John E., 4,131,481, Cl. 521-91.000.

Brodell, Robert F., to United Technologies Corporation. Outer air seal. 4,131,388, Cl. 415-138.000.

Broemer, Heinz: *See*—
Bluethgen, Waldemar; Broemer, Heinz; and Deutscher, Klaus K., 4,131,597, Cl. 260-42.180.

Brooks, C. Robert, to 'Totes', Incorporated. Umbrella structure. 4,131,122, Cl. 135-76.000.

Brown, Joseph R.: *See*—
Siy, Pepe; and Brown, Joseph R., 4,131,880, Cl. 340-146.3SY.

Brown, Milton S.; Burch, Richard M.; and Warth, Guy M., to Rohm and Haas Company. Nickel recovery process. 4,131,641, Cl. 423-34.000.

Brown Oil Tools, Inc.: *See*—
Cochran, Chudleigh B., 4,131,160, Cl. 166-120.000.

Brown, Wynford, to Westvaco Corporation. Process for making lignin gels in bead form. 4,131,573, Cl. 260-17.500.

Bruck, Avraham; and Inbar, Michael, to Elscint Ltd. Method of and apparatus for differentiating between normal and malignant cells. 4,131,800, Cl. 250-461.00B.

Brumfield, Walter T., Jr.; Newsome, Norman M.; and Schweikle, George E., to Square D Company. Cover assembly for panelboard. 4,131,932, Cl. 361-356.000.

Brundell och Jonsson AB: *See*—
Puna, Erich, 4,131,145, Cl. 144-34.00E.

Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, to Sankyo Company, Limited; and Ciba-Geigy Corporation. Stabilization of poly(mono-olefins). 4,131,599, Cl. 260-45.80N.

Bruninx, Edward, to U.S. Philips Corporation. Fluorescent X-ray spectrometer. 4,131,794, Cl. 250-272.000.

Bruno, Anthony T. Snow jack. 4,130,953, Cl. 37-130.000.

Buck, F. O., Jr.: *See*—
Boyer, Robin L.; Lazarus, Sonja E.; and Buck, F. O., Jr., 4,131,282, Cl. 273-271.000.

Buehler Ltd.: *See*—
Keith, Marvin W., Jr., 4,131,403, Cl. 425-127.000.

Bunda, Tsuchio: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,131,086, Cl. 123-3.000.

Bunker Ramo Corporation: *See*—
Stupay, Lawrence J., 4,131,330, Cl. 339-125.00R.

Burch, Richard M.: *See*—
Brown, Milton S.; Burch, Richard M.; and Warth, Guy M., 4,131,641, Cl. 423-34.000.

Burke, Oliver W., Jr.; and Hunt, Barbara P., to Marion Darrah and Joseph Y. Houghton, Co-trustees. Elastomer latex composition. 4,131,584, Cl. 260-29.60N.

Burroughs Corporation: *See*—
Behr, Michael I.; Gyi, Ko K.; Iwan, Wilfred D.; and Palotay, Joseph C., 4,131,924, Cl. 360-106.000.
Christou, Kyriakos, 4,131,899, Cl. 346-140.00R.
Siy, Pepe; and Brown, Joseph R., 4,131,880, Cl. 340-146.3SY.

Burton, Jack D.; and Vandling, John M., to Exxon Research & Engineering Co. Frequency limiter. 4,131,917, Cl. 358-281.000.

Burton, Parsons and Company, Inc.: *See*—
Covington, William, 4,131,696, Cl. 427-164.000.

Busse, Peter, to Heinze, Richard. Fitting for detachable connecting structural parts. 4,131,376, Cl. 403-12.000.

BYK Gulden Lomberg Chemische Fabrik GmbH: *See*—
Amschler, Hermann; Klemm, Kurt; and Ludwig, Gerhard, 4,131,678, Cl. 424-251.000.

C. Itoh & Co.: *See*—
Uchiyama, Hiroshi, 4,131,612, Cl. 260-340.700.

C J Wennberg AB: *See*—
Bengtsson, Ralph; and Larsson, Gunnar, 4,130,927, Cl. 29-432.100.

C. van der Lely NV: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,131,237, Cl. 239-664.000.

Caballero, Edward A. Apparatus and method for growing legume sprouts. 4,130,964, Cl. 47-16.000.

Cable, Daniel K., to Angeles Metal Trim Co. Low cost housing wall structure. 4,130,970, Cl. 52-236.300.

Caine, Merwin A., to Crest Company, The. Self-closing exhaust fan cover. 4,131,060, Cl. 98-116.000.

California Institute of Technology: *See*—
Fender, Derek H.; and Koblasz, Arthur J., 4,131,113, Cl. 128-2.00T.

Calvet, Gerard, to Rhone-Poulenc Industries. Peristaltic tube pump with means preventing complete occlusion of tube. 4,131,399, Cl. 417-477.000.

Campbell, Richard A.: *See*—
Wood, Reggie D., 4,131,768, Cl. 179-178.000.

Campbell, Thomas M.; Ringler, William H.; and Lerner, Howard, to Exxon Research & Engineering Co. Process for the continuous multistage degasification of liquid sulfur. 4,131,437, Cl. 55-53.000.

Canada-Cities Service, Ltd.: *See*—
Porteous, Kenneth, 4,131,535, Cl. 208-11.0LE.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See*—
Porteous, Kenneth, 4,131,535, Cl. 208-11.0LE.

Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Daws, Lee F., 4,131,378, Cl. 403-93.000.
Lloyd, Robert G.; Street, Anthony C.; and Golden, Donald M. G. R., deceased, 4,131,251, Cl. 244-137.00R.

Canevari, Louis T.: *See*—
Hordeski, Edward R.; Canevari, Louis T.; and Macari, Leonard J., 4,131,168, Cl. 177-128.000.

Canon Kabushiki Kaisha: *See*—
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Kawana, Hiroyoshi; Ono, Yusuke; and Matsuda, Mutsuhide, 4,131,350, Cl. 354-31.000.

Canron, Inc.: *See*—
Lund, Raymond R., 4,131,066, Cl. 104-17.00R.

Canron Railgroup: *See*—
Newman, George R.; and Lund, Raymond R., 4,131,067, Cl. 104-17.00R.

Cantley, George: *See*—
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Capewell, David R.: *See*—
Weitzel, Charles E.; and Capewell, David R., 4,131,496, Cl. 148-175.000.

Carborundum Company, The: *See*—
Murty, Hari N., 4,131,566, Cl. 252-423.000.

Carder, Charles H.: *See*—
Hodakowski, Leonard E.; and Carder, Charles H., 4,131,602, Cl. 528-49.000.

Carl Freudenberg, Firma: *See*—
Braumer, Klaus; and Eckmayer, Zdenek, 4,131,650, Cl. 424-28.000.
Krug, Hans-Dietrich, 4,130,948, Cl. 36-44.000.

Carl Still Recklinghausen, Firma: *See*—
Abendroth, Werner, 4,131,421, Cl. 432-247.000.

Carlson, Ronald L.: *See*—
Smith, Grant H.; and Carlson, Ronald L., 4,131,187, Cl. 192-99.00A.

Carollo, Jerome T., to Singer Company, The. Visible light projection device. 4,131,345, Cl. 352-132.000.

Carosello, Theodore F., to Progressive Research Products, Inc. Method of absorbing liquids using a preparation of expanded silicate-based aggregates. 4,131,543, Cl. 210-36.000.

Carpenter Technology Corporation: *See*—
Frantz, Earl L., 4,131,457, Cl. 75-134.00M.

Carpentier, John H.: *See*—
Kufrin, Fred W.; and Carpentier, John H., 4,131,273, Cl. 271-4.000.

Carter, Walter L., to Jackson Machine Products. Adjustable shock absorber. 4,131,266, Cl. 267-34.000.

Caruso, Robert D.; and Setter, Gerald A., Jr., to Western Electric Company, Inc. Frequency adjusting a piezoelectric device by lasering. 4,131,484, Cl. 134-1.000.

Cassia, Antonio M., to Steiner American Corporation. Cut-off mechanism for paper towel dispenser. 4,131,044, Cl. 83-205.000.

Caterpillar Tractor Co.: *See—*
Crumrine, Albert W., Jr.; Fones, Theodore H.; Kostas, James M.; and Vanderburg, Raymond M., 4,131,156, Cl. 165-51.000.
Fischer, Robert L., 4,131,144, Cl. 144-34.00E.
Meisel, Thomas C., Jr., 4,131,201, Cl. 209-661.000.
Scott, Ronald K., 4,131,014, Cl. 73-119.00A.
Wolfgram, Kenneth C., 4,131,172, Cl. 180-69.00R.

Cavarroc, Marcel: *See—*
Grosclaude, Gerard; Regnier, Jean; and Cavarroc, Marcel, 4,131,688, Cl. 426-40.000.

Cavil, David T.; McAuliffe, Gerald N.; and Van Rens, Russell J., to Outboard Marine Corporation. Speed sensitive field weakening control for traction motors. 4,131,832, Cl. 318-358.000.

Ceeco Machinery Manufacturing Limited: *See—*
Varga, Joseph A., 4,130,985, Cl. 57-127.500.

Cekoric, Mark E.; Loring, Robert M.; and Ludwico, William A., to Mobay Chemical Corporation. Talc-based external mold release agent for polyurethane foams. 4,131,662, Cl. 264-51.000.

Center for Design Research and Development N.V.: *See—*
Ambasz, Emilio, 4,131,260, Cl. 248-384.000.

Ceraver S.A.: *See—*
Willem, Michel, 4,130,926, Cl. 29-421.00M.

CGEE Alsthom: *See—*
Courtiol, Bernard, 4,131,012, Cl. 73-167.000.

Chabot, James V.: *See—*
Holka, Thomas C.; Chabot, James V.; and Haddad, Charles, 4,131,308, Cl. 296-1.00S.

Chalmers, Alexander A.; Gailey, J. Lynn; and Wollam, Carl A., to Alcan Aluminum Corporation. Siding panels and the method of production. 4,130,974, Cl. 52-531.000.

Chambers, Thomas V.: *See—*
Cocoros, George; Chambers, Thomas V.; and Hirshfeld, Julian J., 4,131,424, Cl. 8-172.00R.

Chambersburg Engineering Company: *See—*
Hague, Wilmer W.; and Frame, Charles W., 4,131,164, Cl. 173-1.000.

Champion International Corporation: *See—*
Cottrell, Edward D., 4,130,936, Cl. 29-809.000.

Chapman, Robert A., to Racal Group Services Limited. Electrical synchronizing circuits. 4,131,856, Cl. 328-155.000.

Charchian, Loris J., to Dana Corporation. Lubrication arrangement for a coupling device. 4,131,188, Cl. 192-113.00B.

Chatterji, Debajyoti: *See—*
Breiter, Manfred W.; Chatterji, Debajyoti; King, Randall N.; and Park, Dong-Sil, 4,131,226, Cl. 228-198.000.

Chawla, Jogindar M.; von Bockh, Peter; and Dornemann, Manfred, to Agefko Kohlensaure-Industrie GmbH. Device for measuring mass flow. 4,131,015, Cl. 73-199.000.

Chen, Sow-mei C.: *See—*
Floyd, Middleton B., Jr.; Weiss, Martin J.; Gredeinskas, Charles V.; and Chen, Sow-mei C., 4,131,737, Cl. 560-121.000.

Chester, Richard J.: *See—*
Barth, Douglas A.; and Chester, Richard J., 4,131,191, Cl. 194-92.000.

Childeric, Bruno, to Eurotungstene. Rotating anode for x-ray tube. 4,131,718, Cl. 428-548.000.

Chillier-Duchatel, Nicole; and Verger, Bernard, to Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie". Electrochemical oxygen production device. 4,131,532, Cl. 204-256.000.

Choate, James R., to Hydraform Products Corp. Log-burning stove. 4,131,104, Cl. 126-60.000.

Choi, Nam S.; and Heller, Jorge, to Alza Corporation. Structured orthoester and orthocarbonate drug delivery devices. 4,131,648, Cl. 424-22.000.

Chong, Victor M.; and Seitzer, Walter H., to Sun Oil Company of Pennsylvania. Oxygen separation with membranes. 4,131,514, Cl. 204-129.000.

Christensen, Susan W.; and Coker, Cecil H., to Bell Telephone Laboratories, Incorporated. Multiple microphone dereverberation system. 4,131,760, Cl. 179-1.00P.

Christou, Kyriakos, to Burroughs Corporation. Droplet generator for an ink jet printer. 4,131,899, Cl. 346-140.00R.

Chromik, Karel, to H. Bieri AG Liebefeld. Mechanical actuating means for hydraulic control valves. 4,131,126, Cl. 137-270.000.

Chrysler Corporation: *See—*
Daniels, Earl E.; and Crall, Frederick W., 4,131,098, Cl. 123-117.00R.

Ciba-Geigy Corporation: *See—*
Breitenfellner, Franz; and Andreas, Holger, 4,131,595, Cl. 260-40.00R.
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,131,599, Cl. 260-45.80N.
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,131,613, Cl. 260-343.30R.
Miller, Ralph; and Gregg, Harry D., Jr., 4,131,642, Cl. 423-193.000.
Mitra, Panchanan, 4,131,502, Cl. 156-179.000.
Petitpierre, Jean C., 4,131,695, Cl. 427-148.000.
Zahir, Abdul-Cader; and Wyler, Sigfried, 4,131,707, Cl. 428-251.000.

Cipolla, Thomas M., to General Electric Company. Lamp parts feeding device having rotating reference frame. 4,131,192, Cl. 198-469.000.

Cipris, Divna; and Mador, Irving L., to Allied Chemical Corporation. Electrochemical synthesis of organic carbonates. 4,131,521, Cl. 204-59.00R.

Claasen, Theodoor A. C. M.; and Mecklenbrauker, Wolfgang F. G., to U.S. Philips Corporation. Arrangement for converting discrete signals into a discrete single-sideband frequency division-multiplex-signal and vice versa. 4,131,764, Cl. 179-15.0FS.

Clark Equipment Company: *See—*
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,131,225, Cl. 228-161.000.

Clark, Gaylord J. Street brush. 4,130,911, Cl. 15-179.000.

Clark, John S.: *See—*
Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark. John S., 4,131,054, Cl. 90-11.00D.

Clark, Robert L.: *See—*
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,131,677, Cl. 424-256.000.

Clary, Roger, to Howard Machinery Limited. Fruit harvesting machine. 4,130,982, Cl. 56-330.000.

Cleer, Clarence W., Jr., to Ridgway Steel Fabricators, Inc. Fireplace heating system. 4,131,231, Cl. 237-8.00R.

Clemar Manufacturing Corporation: *See—*
Hollabaugh, Michael D.; and Panday, Vinod, 4,131,882, Cl. 340-310.00A.
Kendall, Giles A., Jr., 4,131,331, Cl. 339-126.0RS.

Clement, Warren J., to Sprague Electric Company. Terminal-cover assembly having coined region of reduced cross section compressing resilient bushing. 4,131,935, Cl. 361-433.000.

Clemson, Daniel: *See—*
Austin, James; and Clemson, Daniel, 4,131,805, Cl. 307-147.000.

Clopay Corporation: *See—*
Lee, Maw H.; and Prehodka, Barry V., 4,131,830, Cl. 318-266.000.

Clymer, John C., to Bethlehem Steel Corporation. Autocorrelated pulse processor. 4,131,857, Cl. 328-163.000.

Coady, William J. Educational device for motivating, and for developing scribing and reading skills in, the handicapped. 4,130,946, Cl. 35-37.000.

Cochran, Chudleigh B., to Brown Oil Tools, Inc. Well tool with pressure responsive tightening means. 4,131,160, Cl. 166-120.000.

Cocoros, George; Chambers, Thomas V.; and Hirshfeld, Julian J., to Milliken Research Corporation. Method of dyeing using the combination of certain halogenated hydrocarbons and aromatic solvents in an aqueous dye admixture. 4,131,424, Cl. 8-172.00R.

Coffey, James P.: *See—*
Bernstein, Philip; Coffey, James P.; and Varker, Alan E., 4,131,637, Cl. 260-877.000.

Cogan, Jerry A., Jr.: *See—*
Thomas, Manuel A.; and Cogan, Jerry A., Jr., 4,131,422, Cl. 8-31.000.

Cohen, Jules B., to Medical Laboratory Automation, Inc. Method of assembling disposable pipette tips for shipment to users thereof. 4,130,978, Cl. 53-444.000.

Cohen, Leon E.: *See—*
Lutz, Charles W.; and Cohen, Leon E., 4,131,562, Cl. 252-186.000.

Coker, Cecil H.: *See—*
Christensen, Susan W.; and Coker, Cecil H., 4,131,760, Cl. 179-1.00P.

Coker, James N., to Du Pont de Nemours, E. I., and Company. Adhesive compositions consisting essentially of a vinyl alcohol polymer, a crystalline solvent and a viscosity reducing diluent. 4,131,581, Cl. 260-29.10R.

Coleman Company, Inc., The: *See—*
Curtis, Richard D., 4,131,414, Cl. 431-104.000.

Coleman, Michael G.: *See—*
Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., 4,131,755, Cl. 136-89.00P.

Collin, Per H., to Stora Kopparbergs Bergslags AB. Method for direct manufacture of crude steel. 4,131,452, Cl. 75-60.000.

Colman, Benjamin W.; and Ferar, Montgomery, to Colman, Benjamin W. Food-slicing device. 4,131,043, Cl. 83-167.000.

Combustion Engineering, Inc.: *See—*
Blackburn, Samuel S., Jr.; and Hammer, George P., 4,131,073, Cl. 110-106.000.
Mordarski, Walter J.; and Roth, Jerome, 4,131,511, Cl. 176-68.000.

Comer, Donald T., to Precision Monolithics, Inc. Trimming control circuit for a digital to analog converter. 4,131,884, Cl. 340-347.0CC.

Cominco Ltd.: *See—*
Krauss, Clifford J., 4,131,019, Cl. 73-453.000.

Commette, Denis S.: *See—*
Gusmer, Frederick E.; Commette, Denis S.; and Bairunas, Robert A., 4,131,395, Cl. 417-271.000.

Compagnie Electromecanique: *See—*
Delassus, Jean, 4,131,813, Cl. 310-13.000.

Compagnie Europeenne d'Accumulateurs: *See—*
Dalibard, Gerard; and Pham, Kha M., 4,131,723, Cl. 429-81.000.

Compagnie Generale des Etablissements Michelin: *See—*
Pflieger, Bernard; Sauvage, Philippe; and Tombrel, Francis, 4,131,151, Cl. 164-89.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Valle, Pierre D., 4,131,859, Cl. 330-124.00R.

Conair, Inc.: *See—*
Klos, Daniel J., 4,131,319, Cl. 302-58.000.

Conaway, William H.: *See—*
French, Park; and Conaway, William H., 4,131,367, Cl. 356-405.000.

Concast AG: *See—*
Schmid, Markus, 4,131,153, Cl. 164-442.000.
Vial, Raymond; Fastert, Herbert; and Marti, Heinrich, 4,131,154, Cl. 164-448.000.

Congoleum Corporation: *See—*
Toal, Hugh, 4,130,939, Cl. 30-293.000.

Consarc Corporation: *See*—
Roberts, Raymond J., 4,131,754, Cl. 13-34.000.
Consolidation Coal Company: *See*—
Jamison, Will B.; and Fleck, Henry, 4,131,317, Cl. 299-31.000.
Container Corporation of America: *See*—
Vuilleumier, Ralph O., 4,131,208, Cl. 214-8.50F.
Cooper, James. Remotely controllable electric oven. 4,131,786, Cl. 219-487.000.
Cooper, Martin H., to United States of America, Energy. Magnetic nuclear core restraint and control. 4,131,510, Cl. 176-50.000.
Corbic, Yves J., to Societe dite: Gatrun Anstalt. Receptacle made of thermoplastic material. 4,131,211, Cl. 215-2.000.
Cornell, Martin C., III: *See*—
Doorakian, George A.; Schmidt, Dennis L.; and Cornell, Martin C., III, 4,131,633, Cl. 260-837.00R.
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Leger, Andre, to Rhone-Poulenc Industries. Naphtyridine derivatives. 4,131,674, Cl. 424-248.540.
Cotton, Gordon: *See*—
Kohl, Harry E.; and Cotton, Gordon, 4,131,006, Cl. 72-67.000.
Cottrell, Edward D., to Champion International Corporation. Stick handling and inserting method and apparatus. 4,130,936, Cl. 29-809.000.
Courtiol, Bernard, to CGEE Alsthom. Device for detecting impacts on a target. 4,131,012, Cl. 73-167.000.
Covington, William, to Burton, Parsons and Company, Inc. Contact lens treatment. 4,131,696, Cl. 427-164.000.
Cox, Lawton E.: *See*—
Spitz, Edward K.; and Cox, Lawton E., 4,131,661, Cl. 264-38.000.
Coxon, DeWayne; and Bregg, Gary N., to Jordan College. Solar collector. 4,131,109, Cl. 126-270.000.
Crall, Frederick W.: *See*—
Daniels, Earl E.; and Crall, Frederick W., 4,131,098, Cl. 123-117.00R.
Crawford, Theron L.: *See*—
Sehulster, Joseph P.; Halbach, Stephen N.; Haar, Darrell; and Crawford, Theron L., 4,131,408, Cl. 425-410.000.
Crawley, Keenan L.; and Miller, Lester I., to Du Pont de Nemours, E. I., and Company. Polyurethane metallic enamel. 4,131,571, Cl. 260-17.00R.
Crawley, Lantz S.: *See*—
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,131,611, Cl. 260-326.800.
Creasy, Walter S.; and Reimschuessel, Herbert K., to Allied Chemical Corporation. Solution of polyhydroxy methylene and products made therefrom. 4,131,669, Cl. 264-178.00F.
Credelle, Thomas L., to RCA Corporation. Modular flat display device with beam convergence. 4,131,823, Cl. 313-422.000.
Crenshaw, Marilyn: *See*—
Martinsons, Aleksandrs; and Crenshaw, Marilyn, 4,131,519, Cl. 204-38.00B.
Crest Company, The: *See*—
Caine, Merwin A., 4,131,060, Cl. 98-116.000.
Crinkelmeyer, Oliver W.; and Morris, Earl F., to Dow Chemical Company, The. Aqueous hydraulic cement slurry. 4,131,578, Cl. 260-17.500.
Crisan, Cornel: *See*—
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Leger, Andre, 4,131,674, Cl. 424-248.540.
Crise, George W. Variable displacement internal combustion engine having automatic piston stroke control. 4,131,094, Cl. 123-48.00B.
Crisp, Norman F.: *See*—
Warland, George W.; and Crisp, Norman F., 4,131,032, Cl. 74-449.000.
Criswell, Thomas: *See*—
Gillett, Kenneth; Steiner, Edward L.; Fiske, Kenton W.; Davis, Kenneth A.; Kukucka, William P.; Criswell, Thomas; and Richardson, Philip, 4,131,942, Cl. 364-200.000.
Richardson, Philip; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; and Criswell, Thomas, 4,131,945, Cl. 364-200.000.
Crookston, Ronald W.; and Meyer, Thomas N., to Westinghouse Electric Corp. Circuit interrupter operating mechanism. 4,131,774, Cl. 200-82.00B.
Crumrine, Albert W., Jr.; Fones, Theodore H.; Kostas, James M.; and Vanderburg, Raymond M., to Caterpillar Tractor Co. Fan shroud. 4,131,156, Cl. 165-51.000.
CSELT - Centro Studi e Laboratori Telecomunicazioni: *See*—
Giusto, Pietro P., 4,131,761, Cl. 179-15.0BY.
Csutor, Frank. Ice skate carrying case with exterior end wall skate support. 4,131,196, Cl. 206-278.000.
Cubic Productron: *See*—
Schmidt, Gunter, 4,131,356, Cl. 354-322.000.
Cudby, Joseph W.: *See*—
Hind, Robert D.; Thrower, Anthony; and Cudby, Joseph W., 4,131,219, Cl. 222-603.000.
Curtis Mathes Manufacturing Co.: *See*—
Dreiske, Erwin J., 4,131,853, Cl. 325-464.000.
Curtis, Richard D., to Coleman Company, Inc., The. Lantern with kerosene preheater. 4,131,414, Cl. 431-104.000.
Czyz, Jerzy: *See*—
Kiedik, Maciej; Grzywa, Edward; Kolt, Jozef; Terelak, Kazimierz; Czyz, Jerzy; and Niezgoda, Anna, 4,131,749, Cl. 568-781.000.
Daicel Ltd.: *See*—
Ono, Koichi; Takahara, Toshiyuki; and Ito, Tetsuyoshi, 4,131,299, Cl. 280-736.000.
Daido Sanso Kabushiki Kaisha: *See*—
Tsujimoto, Minoru; Okada, Minoru; Suzuki, Yuji; and Hirai, Toshihiro, 4,131,528, Cl. 204-157.10R.
Dainippon Ink & Chemicals Inc.: *See*—
Matsumoto, Yasuhiro; and Eguchi, Hisanori, 4,131,636, Cl. 260-875.000.
D'Alelio, Gaetano F. Modified polyamic acid from aminophthalic acid anhydride and dianhydride. 4,131,730, Cl. 528-327.000.
Dalibard, Gerard; and Pham, Kha M., to Compagnie Europeenne d'Accumulateurs. Lead storage battery with limited evolution of gas. 4,131,723, Cl. 429-81.000.
D'Alo, Giorgio, to A. Wasserman S.p.A. Furan derivative for use as pharmaceutical product particularly for the treatment of rheumatic illnesses. 4,131,615, Cl. 260-347.300.
Dammann, Peter; Schippers, Heinz; Turk, Herbert; and Schiminski, Herbert, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Yarn spinning apparatus and process. 4,130,983, Cl. 57-5.000.
Dana Corporation: *See*—
Charchian, Loris J., 4,131,188, Cl. 192-113.00B.
Schall, Myron M., 4,131,185, Cl. 192-53.00B.
Danberg, Victor. Apparatus for reducing fragmentary stock. 4,131,247, Cl. 241-49.000.
Daniels, Earl E.; and Crall, Frederick W., to Chrysler Corporation. Engine timing control circuit having a single pick-up for both starting and running. 4,131,098, Cl. 123-117.00R.
Dannhauser, Friedrich; and Porst, Alfred, to Siemens Aktiengesellschaft. Power diode. 4,131,339, Cl. 357-13.000.
Darms, Roland: *See*—
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,131,613, Cl. 260-343.30R.
Data General Corporation: *See*—
Austin, James; and Clemson, Daniel, 4,131,805, Cl. 307-147.000.
Daub, Dirk; and Klaver, Olof E. H., to U.S. Philips Corporation. Semiconductor protection device having a bipolar lateral transistor. 4,131,908, Cl. 357-42.000.
Daughton, John W.: *See*—
Richardson, Philip; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; and Criswell, Thomas, 4,131,945, Cl. 364-200.000.
Davin, Andre: *See*—
Petit, Leon; Davin, Andre; and Gueguen, Jacques, 4,131,607, Cl. 260-123.500.
Davis, Earl K.; and Hansen, Kent W., to Motorola, Inc. Sealing glass compositions and method. 4,131,478, Cl. 106-53.000.
Davis, Fred R., to R.C.A. Rubber Company, The. Flame retardant rubber flooring composition. 4,131,592, Cl. 260-23.70R.
Davis, Kenneth A.: *See*—
Gillett, Kenneth; Steiner, Edward L.; Fiske, Kenton W.; Davis, Kenneth A.; Kukucka, William P.; Criswell, Thomas; and Richardson, Philip, 4,131,942, Cl. 364-200.000.
Davis, Paul H., Jr., to DuKane Corporation. Ultra-sonic horn. 4,131,505, Cl. 156-580.100.
Davis, Richard S.: *See*—
Fletcher, Steven J.; Wright, Jeffrey L.; and Davis, Richard S., 4,131,949, Cl. 364-900.000.
Davis, Sylvia. Telephone lock. 4,131,769, Cl. 179-189.00D.
Davis, William F.; and Stein, Marc T., to Motorola, Inc. Voltage clamp device for monolithic circuits. 4,131,928, Cl. 361-56.000.
Davis, William R.; and Gordon, Michael D., to M&T Chemicals Inc. Reduction of phosphine oxides. 4,131,624, Cl. 260-606.50P.
Davison, John B.: *See*—
Wynne, Kenneth J.; and Davison, John B., 4,131,609, Cl. 260-314.500.
Daws, Lee F., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Self-locking hinge. 4,131,378, Cl. 403-93.000.
Day, Ralph D. Constant current power supply. 4,131,939, Cl. 363-126.000.
Dayco Corporation: *See*—
Bollmer, Jacob A., 4,131,040, Cl. 83-50.000.
Frisch, Paul P., 4,131,131, Cl. 137-559.000.
Voet, Harry C., 4,131,703, Cl. 428-95.000.
White, Jack D., Jr., 4,131,030, Cl. 74-232.000.
Dean, Roy D.; and Weiland, Richard H., to Boeing Company, The. Apparatus for compensating for airflow blockage in aircraft slotted flap assemblies. 4,131,252, Cl. 244-212.000.
De Bliquy, Michael C. Shaft end coupling means. 4,131,380, Cl. 403-217.000.
Debrotnic, John S., to United States of America, Air Force. Degasser and liquid seal reservoir. 4,131,438, Cl. 55-204.000.
Deckert, Cheryl A., to RCA Corporation. Pretreatment of polyvinyl chloride plastics for electroless deposition. 4,131,698, Cl. 427-304.000.
Deem, Curtis. Vacuum coin collection apparatus. 4,131,318, Cl. 302-2.00R.
Dees, Barry N., Jr.: *See*—
Dees, Barry N., Sr.; and Dees, Barry N., Jr., 4,131,876, Cl. 340-58.000.
Dees, Barry N., Sr.; and Dees, Barry N., Jr. Pneumatic tire pressure monitor. 4,131,876, Cl. 340-58.000.
DeFrank, Michael P., to Raybestos-Manhattan, Inc. Epoxy-rubber based friction material. 4,131,590, Cl. 260-37.0EP.
Delassus, Jean, to Institut de Recherches de la Siderurgie Francaise (Irsid); and Compagnie Electromecanique. Electromagnetic apparatus generating a gliding magnetic field. 4,131,813, Cl. 310-13.000.
Della-Vedowa, Richard P.; and Shahryar, Ishaq M., to Solec International, Inc. Solar cell module and method of making same. 4,131,123, Cl. 136-89.00P.

DeLuccia, Charles R. Medicinal skin cream for psoriasis and method. 4,131,652, Cl. 424-241.000.

Deluga, Sigmund S.: *See—*
Thompson, Jerry L.; Deluga, Sigmund S.; Harnach, James W.; and Shamah, Eliahu, 4,131,551, Cl. 252-33.000.

DEMAG, Aktiengesellschaft: *See—*
Keulertz, Werner; and Wessel, Karl-Heinz, 4,131,240, Cl. 242-72.100.

Demers, Jean G.: *See—*
Nikitits, Edwin; and Demers, Jean G., 4,131,311, Cl. 297-159.000.

Demrick, Carl J., to Arco Industries Corporation. Forming and coating apparatus. 4,130,933, Cl. 29-564.000.

den Hertog, Willem C.: *See—*
de Putter, Warner J.; and den Hertog, Willem C., 4,131,407, Cl. 425-393.000.

Denison, Don E.: *See—*
Lingl, Hans, Jr.; and Denison, Don E., 4,131,072, Cl. 110-106.000.

Denney, Jerry W., to American Monitor Corporation. Urea assay. 4,131,425, Cl. 23-230.00B.

Denney, Jerry W., to American Monitor Corporation. Urea assay. 4,131,429, Cl. 23-230.00B.

Denney, Jerry W., to American Monitor Corporation. Urea assay. 4,131,430, Cl. 23-230.00B.

Densmore, Dennis G., to Koehring Company. Boom length sensing and indicating system with self-synchronization. 4,130,940, Cl. 33-139.000.

Denton, Dennis N.; and Boyd, David G., to Garlock Inc. Bonded TFE lip seal. 4,131,285, Cl. 277-1.000.

Denu, Francis, to Adidas Fabrique de Chaussures de Sport. Sole for footwear, especially sports footwear. 4,130,947, Cl. 36-30.00R.

De Pierre, Vincent; and Gurney, Ferdinand J., to United States of America, Air Force. Method and apparatus for use in the extrusion of billets. 4,131,461, Cl. 75-208.0CS.

de Putter, Warner J.; and den Hertog, Willem C., to Wavin B.V. Device for forming tube with thickened socket end. 4,131,407, Cl. 425-393.000.

de Putter, Warner J., to Wafilin B.V. Removing coagulable substances from an aqueous medium. 4,131,541, Cl. 210-23.00F.

De Rossi, Rita. Automatic hooking safety-hook for doors of dwellings and offices. 4,131,307, Cl. 292-268.000.

Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, to Feldmuhle Aktiengesellschaft. Recording material containing asbestos. 4,131,710, Cl. 428-328.000.

Deters, Elmer M., to Wylain, Inc. Automatic fluid dispensing apparatus. 4,131,140, Cl. 141-206.000.

Deutsche Babcock Aktiengesellschaft: *See—*
Bitterlich, Eberhard; Thelen, Franz; and Weber, Henning, 4,130,992, Cl. 60-652.000.

Deutscher, Klaus K.: *See—*
Bluethgen, Waldemar; Broemer, Heinz; and Deutscher, Klaus K., 4,131,597, Cl. 260-42.180.

DeVinney, Robert E., to General Motors Corporation. Enclosure spanning drain for engine valley covers and the like. 4,131,101, Cl. 123-195.00C.

Dick, William J. Common bell ringing apparatus for multiple button key telephone set. 4,131,770, Cl. 179-84.00L.

Dickes, Roger D. Workpiece and work tool cutting jig. 4,131,048, Cl. 83-745.000.

Dickinson, George A., to Pilkington Brothers Limited. Method and apparatus for manufacturing flat glass on molten metal. 4,131,446, Cl. 65-99.00A.

Dieckhoff, Rolf. Projector. 4,131,346, Cl. 353-15.000.

Dietrich, William J., Sr., to DMI, Inc. Dual wheel assembly for tractors. 4,131,323, Cl. 301-36.00R.

Dietz, Charles R., to United States of America, Navy. Missile system. 4,131,065, Cl. 102-49.400.

Dietzel, Walter, to Braunschweigische Maschinenbauanstalt. Continuously operating sugar centrifuge. 4,131,482, Cl. 127-19.000.

Diggens, Albert A., to Orion Research Incorporated. Method of adjusting pH. 4,131,428, Cl. 23-230.00R.

Dilling, Peter, to Westvaco Corporation. Lignin-containing dye dispersing composition. 4,131,564, Cl. 252-353.000.

Dion, Exsior. Plow attachment for roto-tiller. 4,130,952, Cl. 37-41.000.

Discepolo, Joseph: *See—*
Marquis, Edgar E.; and Discepolo, Joseph, 4,131,186, Cl. 192-67.00R.

Disco Kabushiki Kaisha: *See—*
Ono, Takatoshi; and Ikeda, Michio, 4,131,267, Cl. 269-21.000.

Distler, Edward C.: *See—*
Kirkpatrick, Harold B.; Distler, Edward C.; and Menzin, Marvin, 4,131,114, Cl. 128-90.000.

Dlugos, Daniel F., to Pitney-Bowes, Inc. Mailing system. 4,131,946, Cl. 364-466.000.

DMI, Inc.: *See—*
Dietrich, William J., Sr., 4,131,323, Cl. 301-36.00R.

Dmitrieva, Valentina A.: *See—*
Kagan, Naum Y.; Bortnik, Vladimir M.; Korenbljum, Isai V.; Razumeev, Jury A.; Lyass, Abram M.; Borsuk, Pavel A.; Usubov, Zokhrab G. O.; and Dmitrieva, Valentina A., 4,131,477, Cl. 106-38.350.

Dr. Beck & Co AG: *See—*
Wendt, Hartmut; Von Gruner, Horst; and Janssen, Harald, 4,131,693, Cl. 427-117.000.

Doehler, Peter: *See—*
Baumgartner, Erich R.; and Doehler, Peter, 4,130,955, Cl. 38-82.000.

Doerflinger, Karl: *See—*
Becker, Harry; Doerflinger, Karl; Ey, Klaus; Reiter, Georg; Rutzmoser, Hermann; and Theus, Richard, 4,131,934, Cl. 361-428.000.

Dolfini, Joseph E.: *See—*
Harrison, Boyd L.; and Dolfini, Joseph E., 4,131,683, Cl. 424-277.000.

Dombrowski, Joseph A.; Baxter, Clement T.; Howard, Frederick B.; and Simpson, George H., to GTE Sylvania Incorporated. Incandescent lamp socket having overtemperature protector. 4,131,868, Cl. 337-113.000.

Dominianni, Samuel J.; and Ryan, Charles W., to Eli Lilly and Company. Intermediates for 5-(tertiary alkyl) resorcinol preparation. 4,131,656, Cl. 260-951.000.

Donahoo, Joe T., to General Electric Company. Concentrated winding salient-pole shaded pole motors having multiple short circuited shading coils for each pole and methods of making same. 4,131,814, Cl. 310-172.000.

Doorakian, George A.; Schmidt, Dennis L.; and Cornell, Martin C., III, to Dow Chemical Company, The. Latent catalysts for promoting reaction of epoxides with phenols and/or carboxylic acids. 4,131,633, Cl. 260-837.00R.

Dorn, Gordon L., to J. K. and Susie L. Wadley Research Institute and Blood Bank. Method for detecting microbial pathogens employing a cushioning agent. 4,131,512, Cl. 195-103.50M.

Dornemann, Manfred: *See—*
Chawla, Jogindar M.; von Bockh, Peter; and Dornemann, Manfred, 4,131,015, Cl. 73-199.000.

Douglas, Ulysee. Combined arm and leg rest for drivers. 4,131,298, Cl. 280-727.000.

Dow Chemical Company, The: *See—*
Crinkelmeyer, Oliver W.; and Morris, Earl F., 4,131,578, Cl. 260-17.500.
Doorakian, George A.; Schmidt, Dennis L.; and Cornell, Martin C., III, 4,131,633, Cl. 260-837.00R.
McCarty, Leslie P., 4,131,647, Cl. 424-10.000.
Pews, R. Garth, 4,131,619, Cl. 260-543.00R.
Priddy, Duane B., 4,131,728, Cl. 526-204.000.

Drabert Sohne, Firma: *See—*
Vogtherr, Burkhard, 4,131,315, Cl. 297-286.000.

Drake, Paul H.; Humphris, Colin J.; and Preedy, John E., to British Petroleum Company Limited, The. Polymer composition. 4,131,481, Cl. 521-91.000.

Drefcinski, Earl D.: *See—*
Johnson, Robert G.; and Drefcinski, Earl D., 4,131,294, Cl. 280-179.00R.

Dreiske, Erwin J., to Curtis Mathes Manufacturing Co. Electronic multiple channel tuner. 4,131,853, Cl. 325-464.000.

Dresser Industries, Inc.: *See—*
Gerstenmaier, William J.; and Todd, John A., 4,131,216, Cl. 222-52.000.

Drobnik, Stefan: *See—*
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,131,563, Cl. 252-301.10W.

DSO "Montaji" — Promishleno Montajno Upravlenie: *See—*
Ivanov, Ivan B., 4,130,969, Cl. 52-80.000.

Dubost, Rene; Gauthier, Francis; and Mignien, Georges, to Societe Anonyme Dite: Les Cables de Lyon. Device for the protective covering of optical fibres. 4,131,404, Cl. 425-129.00R.

Dudley, Leslie P. Stereoscopic optical viewing system. 4,131,342, Cl. 352-43.000.

Duisburger Kupferhutte: *See—*
Piret, Norbert L.; Hopper, Meinolf; and Kudelka, Herbert, 4,131,454, Cl. 75-83.000.

DuKane Corporation: *See—*
Davis, Paul H., Jr., 4,131,505, Cl. 156-580.100.

Dunn, Bruce S., to General Electric Company. Composite body and method of forming. 4,131,694, Cl. 427-126.000.

Du Pont de Nemours, E. I., and Company: *See—*
Bergna, Horacio E.; and Kirkland, Joseph J., 4,131,542, Cl. 210-31.00C.
Bigelow, John H., 4,131,467, Cl. 96-66.300.
Coker, James N., 4,131,581, Cl. 260-29.10R.
Crawley, Keenan L.; and Miller, Lester I., 4,131,571, Cl. 260-17.00R.
England, David C., 4,131,740, Cl. 560-180.000.
Gosser, Lawrence W., 4,131,646, Cl. 423-591.000.
Sprauer, Jerome W., 4,131,712, Cl. 528-335.000.
Stiles, Alvin B., 4,131,616, Cl. 260-449.60M.
Tynan, Daniel G., 4,131,371, Cl. 366-301.000.

Durkoppwerke GmbH: *See—*
Riss, Gerhard, 4,131,074, Cl. 112-121.140.

DURST AG Fabrik Fototechnischer Apparate: *See—*
Gandini, Mario, 4,131,362, Cl. 355-71.000.

Dwight, Donald D., to Aluminum Company of America. Carbon electrode production. 4,131,417, Cl. 432-6.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Alfter, Franz W.; Breitscheidel, Hans-Ulrich; Mecklenburg, Gunter; and Spielau, Paul, 4,131,702, Cl. 428-76.000.

Dynascan Corporation: *See—*
Stone, Dennis C., 4,131,846, Cl. 324-132.000.

Dziala, Gabriela: *See—*
Klopotek, Alojzy; Uminski, Jerzy; and Dziala, Gabriela, 4,131,556, Cl. 252-106.000.

Dzus Fastener Co., Inc.: *See—*
Dzus, Julius F., 4,130,929, Cl. 29-456.000.

Dzus, Julius F., to Dzus Fastener Co., Inc. Wound spring receptacle. 4,130,929, Cl. 29-456.000.

E. C. Chemical Ind. Co., Ltd.: *See—*
Uchiyama, Hiroshi, 4,131,612, Cl. 260-340.700.

E. R. Squibb & Sons, Inc.: *See—*
Sundeen, Joseph E.; and Hauck, Frederic P., 4,131,744, Cl. 560-252.000.

E-Systems, Inc.: *See—*
Berglund, David B., 4,131,248, Cl. 244-3.160.
Eyres, William G., 4,131,010, Cl. 73-11.000.

Eastman Kodak Company: *See—*
Firth, Ronald R.; and Horak, Jerry R., 4,131,925, Cl. 360-130.000.
Lloyd, Gareth A.; and Sasson, Steven J., 4,131,919, Cl. 360-9.000.
Morris, Don L., 4,131,739, Cl. 560-179.000.
Petropoulos, Constantine C., 4,131,465, Cl. 96-35.000.

Easton, Ray D.; Jakobi, Phil F.; and Zabik, Andrew L., to BJR Machine & Gear. Precision gear crown grinding machine. 4,130,967, Cl. 51-5.00D.

Ebauches S.A.: *See—*
Ramet, Gilbert, 4,130,986, Cl. 58-23.00R.
Scherrer, Igor; Berney, Jean-Claude; and Robert-Grandpierre, Jean-Claude, 4,130,988, Cl. 58-85.500.

Eby Company: *See—*
Sterling, Maurice, 4,131,257, Cl. 248-67.500.

Eck, John C., to Wilputte Corporation. Automatic control apparatus for oil gas machine operation. 4,131,435, Cl. 48-61.000.

Eckel, John D.: *See—*
Barr, Robert H.; and Eckel, John D., 4,131,142, Cl. 141-302.000.

Eckmayer, Zdenek: *See—*
Braumer, Klaus; and Eckmayer, Zdenek, 4,131,650, Cl. 424-28.000.

Ecolaire Incorporated: *See—*
Williams, George J.; and Boyer, Robert C., 4,131,270, Cl. 269-321.00W.

Ectrice. Ltd.: *See—*
Erazo, Julio N., 4,130,993, Cl. 60-721.000.

Eddy, Albert W.; and Lyngklip, Roger W., to Technigraph Corporation, by said Roger W. Lyngklip. Button and apparatus for fabrication thereof. 4,130,956, Cl. 40-1.500.

Edgar, Ralph W. Ash tray. 4,131,120, Cl. 131-235.00R.

Edwards, Lars T.; and Trowbridge, Lyle N., to GAF Corporation. Silver recovery. 4,131,455, Cl. 75-118.00R.

Egorova, Tatyana S.: *See—*
Lakernik, Mark M.; Shabalina, Roza I.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Golovachev, Anatoly I.; and Egorova, Tatyana S., 4,131,451, Cl. 75-14.000.

Eguchi, Hisanori: *See—*
Matsumoto, Yasuhiro; and Eguchi, Hisanori, 4,131,636, Cl. 260-875.000.

Ehrat, Kurt, to Gretag Aktiengesellschaft. Method and apparatus for determining the relative positions of corresponding points or zones of a sample and an orginal. 4,131,879, Cl. 340-146.30H.

Ehrenberger, Frank T., to Square D Company. Motorized drive assembly for a circuit breaker operator. 4,131,776, Cl. 200-158.000.

Eibe, Werner W., to Blaw-Knox Foundry & Mill Machinery, Inc. Rolling mill gauge and flatness calibration system. 4,131,004, Cl. 72-8.000.

Eickhoff, Jurgen; and Binger, Bernhard, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Mounting for traction member with lateral step-down transmission. 4,131,169, Cl. 180-9.620.

Einsel, Kenneth D.; and Johnson, Roland W., to Hastings Equity Grain Bin Mfg. Co. Adjustably turnable shaft-guard. 4,130,998, Cl. 64-3.000.

Einstein, Bernard C.; and Spring, Peter, to Lasag AG. Method of and apparatus for machining large numbers of holes of precisely controlled size by coherent radiation. 4,131,782, Cl. 219-121.0LM.

Elahi, Nasik. Macroencapsulated sorbent element and process for using the same. 4,131,544, Cl. 210-40.000.

Electric Power Research Institute, Inc.: *See—*
Breiter, Manfred W.; Chatterji, Debajyoti; King, Randall N.; and Park, Dong-Sil, 4,131,226, Cl. 228-198.000.
Fung, Shun C.; and Pan, Yen-Chi, 4,131,721, Cl. 429-13.000.
Hanes, Maurice H.; and Lowry, Lewis R., 4,131,905, Cl. 357-30.000.
Pelly, Brian R.; and Wood, Peter, 4,131,937, Cl. 363-96.000.

Electro-Therm, Inc.: *See—*
Shutt, James R., 4,131,785, Cl. 219-326.000.

Eli Lilly and Company: *See—*
Dominianni, Samuel J.; and Ryan, Charles W., 4,131,656, Cl. 260-951.000.
Huffman, George W., 4,131,672, Cl. 424-246.000.
Michel, Karl H.; and Miller, Robert F., 4,131,547, Cl. 210-198.00C.
Ryan, Charles W., 4,131,614, Cl. 260-345.300.

Elscint Ltd.: *See—*
Bruck, Avraham; and Inbar, Michael, 4,131,800, Cl. 250-461.00B.

Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., to Rohm and Haas Company. Water-based coating compositions comprising a vinyl addition polymer and an acrylic ester of dicyclopentadiene. 4,131,580, Cl. 260-29.6RW.

Emmons, William D.; and Swift, Graham, to Rohm and Haas Company. Polymers of sulfonic acid monomers. 4,131,736, Cl. 560-14.000.

Energy and Minerals Research Co.: *See—*
Tarpley, William B., Jr., 4,131,238, Cl. 241-30.000.

Energy Processing and Equipment Co.: *See—*
Stephanoff, Nicholas N., 4,131,239, Cl. 241-39.000.

Energy Systems, Incorporated: *See—*
Hanson, Robert C.; and Hanson, Leon C., 4,131,084, Cl. 122-33.000.

Engelsmann, Dieter, to AGFA-Gevaert AG. Photographic camera. 4,131,353, Cl. 354-197.000.

England, David C., to Du Pont de Nemours, E. I., and Company. Alkyl perfluoro-ω-fluoroformyl esters and their preparation. 4,131,740, Cl. 560-180.000.

English, Christopher D., to Spar Aerospace Producs Ltd. Attachment of side covers to linear induction motor. 4,131,812, Cl. 310-13.000.

Ennis, Thomas H., to Jack Russell Company, Inc. Superior performance Yo-Yo. 4,130,962, Cl. 46-61.000.

Entwistle, Ian D., to Shell Oil Company. Propanimidothioic acid derivatives. 4,131,449, Cl. 71-98.000.

Eocom Corporation: *See—*
Harbaugh, Steven K.; and Mitchell, Frank R., 4,131,029, Cl. 74-89.150.

Epmeier, Robert T., to Arkla Industries, Inc. Method of joining a tube to a plate. 4,130,932, Cl. 29-523.000.

Epstein, Joseph W.: *See—*
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,131,611, Cl. 260-326.800.

Erazo, Julio N., to Ectrice, Ltd. Method and apparatus for converting thermal energy to rotational energy. 4,130,993, Cl. 60-721.000.

Erb, Hans Joachim; Brandt, Jurgen; and Kirschbaum, Peter, to Hartman & Braun Aktiengesellschaft. Printing apparatus. 4,131,900, Cl. 346-162.000.

Erickson, Richard W.; Pallaske, James; and Talbert, Stephen, to Becton, Dickinson Electronics Company, by said Richard Erickson and James Pallaske. Rotary switch with spaced circuit boards and discrete contacts on rotor opposite faces electrically insulated from furthermost board. 4,131,771, Cl. 200-11.0DA.

Erickson, Wayne K.; and Walters, John P., to Phillips Petroleum Company. Nonwoven fabric comprising needled and selectively fused fine and coarse filaments having differing softening temperatures which is useful as a backing in the production of tufted materials. 4,131,704, Cl. 428-95.000.

Erikson, Keith W.: *See—*
Erikson, Kenneth W.; and Erikson, Keith W., 4,131,031, Cl. 74-441.000.

Erikson, Kenneth W.; and Erikson, Keith W., to Kerk Motion Products, Inc. Anti-backlash nut assembly. 4,131,031, Cl. 74-441.000.

Ernst Flitsch GmbH U. Co.: *See—*
Gotzenberger, Rudibert, 4,131,128, Cl. 137-556.000.

Ernst Leitz GmbH: *See—*
Bluethgen, Waldemar; Broemer, Heinz; and Deutscher, Klaus K., 4,131,597, Cl. 260-42.180.

Erwin, Louis R., to Bendix Corporation, The. Noise reducing control valve for a hydraulic brake booster. 4,131,055, Cl. 91-378.000.

Erwin Sick Gesellschaft m.b.H. Optik-Elektronik: *See—*
Sick, Erwin; Walter, Arthur; and Fetzer, Gunter, 4,131,804, Cl. 250-566.000.

Esanu, Andre, to Societe d'Etudes de Produits Chimiques. Preparation of new isobutylramide derivatives. 4,131,617, Cl. 260-465.00D.

ESB Incorporated: *See—*
Bernstein, Philip; Coffey, James P.; and Varker, Alan E., 4,131,637, Cl. 260-877.000.

Esenovsky-Lashkov, Jury K.: *See—*
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,131,184, Cl. 192-3.260.

ESPE Fabrik Pharmazeutischer Praparate GmbH: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dietrich, 4,131,729, Cl. 526-282.000.

Essex Group, Inc.: *See—*
Sokoly, John; and Roberts, Kenneth N., 4,131,306, Cl. 292-201.000.

Essex International, Inc.: *See—*
Karkoski, Joseph; Payette, Lionel J.; and Shurboff, John D., 4,131,714, Cl. 428-379.000.

Ethyl Corporation: *See—*
Keblys, Kestutis A.; and McEven, John M., 4,131,645, Cl. 423-501.000.

Etoh, Kunihiko; and Sugiura, Katsumi, to Toyoda-Koki Kabushiki-Kaisha. Displacement amount detecting device. 4,131,838, Cl. 318-603.000.

Eurotungstene: *See—*
Childeric, Bruno, 4,131,718, Cl. 428-548.000.

Evans, Delme; Saunders, John C.; and Williamson, William R. N., to Lilly Industries Limited. Heteroaryl ketone derivatives. 4,131,682, Cl. 424-275.000.

Everson, Clifford G. Backhoe jaw attachment. 4,131,210, Cl. 214-147.00G.

Ex-Cell-O Corporation: *See—*
Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., 4,131,054, Cl. 90-11.00D.

Expert Industrial Controls Limited: *See—*
Torr, Alan C., 4,131,866, Cl. 335-262.000.

Exxon Production Research Company: *See—*
Gunderson, Richard H.; and Ilfrey, William T., 4,131,287, Cl. 277-191.000.

Exxon Research & Engineering Co.: *See—*
Brenner, Douglas, 4,131,587, Cl. 260-32.60A.
Burton, Jack D.; and Vandling, John M., 4,131,917, Cl. 358-281.000.
Campbell, Thomas M.; Ringler, William H.; and Lerner, Howard, 4,131,437, Cl. 55-53.000.
Makowski, Henry S.; and O'Farrell, Charles P., 4,131,586, Cl. 260-31.20R.
VanAuken, Richard L., 4,131,701, Cl. 428-36.000.

Winter, William E.; and Luzarraga, Mamerto G., 4,131,537, Cl. 208-216.000.
Ey, Klaus: *See—*
Becker, Harry; Doerflinger, Karl; Ey, Klaus; Reiter, Georg; Rutzmoser, Hermann; and Theus, Richard, 4,131,934, Cl. 361-428.000.
Eyres, William G., to E-Systems, Inc. Hydraulic test set. 4,131,010, Cl. 73-11.000.
Ezoe, Mituhiko: *See—*
Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; Manaka, Nobuzi; and Ezoe, Mituhiko, 4,131,089, Cl. 123-32.0EE.
Fabbrini, Riccardo: *See—*
Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbrini, Riccardo, 4,131,621, Cl. 260-551.00C.
Fabio, Paul F.: *See—*
Lang, Stanley A., Jr.; Fabio, Paul F.; Lin, Yang-I; Murdock, Keith C; and Fields, Thomas L., 4,131,676, Cl. 424-248.560.
Faigle, Heinz: *See—*
Menia, Manfred, 4,131,255, Cl. 246-430.000.
Fairchild Camera and Instrument Corporation: *See—*
Kuo, James R., 4,131,808, Cl. 307-270.000.
Falchle, Jorg: *See—*
Wanner, Karl; Bleicher, Manfred; and Falchle, Jorg, 4,131,165, Cl. 173-48.000.
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., to American Cyanamid Company. Azabicyclohexanes. 4,131,611, Cl. 260-326.800.
Fardal, Randolph G.; and Rickerd, Calvin P., to International Harvester Company. Combine automatic travel control system. 4,130,980, Cl. 56-10.200.
Farfaglia, Silvio T., to Phillips Petroleum Company. Apparatus for forming a convoluted container sidewall. 4,131,057, Cl. 93-81.00R.
Fastert, Herbert: *See—*
Vial, Raymond; Fastert, Herbert; and Marti, Heinrich, 4,131,154, Cl. 164-448.000.
Faul, Wolfgang; and Kastening, Bertel, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of electrochemically processing metallic surfaces. 4,131,523, Cl. 204-129.100.
Fauth, Gunter; and Muller, Herbert, to AGFA-Gevaert AG. Photographic apparatus of the self-developing type. 4,131,352, Cl. 354-86.000.
Federal Paper Board Co., Inc.: *See—*
Fischer, Edward F., 4,131,198, Cl. 206-419.000.
Feigin, Robert, to Sybron Corporation. Leveling agent for floor polishes. 4,131,585, Cl. 260-29.6MQ.
Feldmuhle Aktiengesellschaft: *See—*
Dessauer, Guido; Ramlow, Kurt; Riecke, Kurt; and Wirnitzer, Franz, 4,131,710, Cl. 428-328.000.
Feldstein, Nathan. Method of preparation and use of electroless plating catalysts. 4,131,699, Cl. 427-306.000.
Felkel, Edward M., to United States Steel Corporation. Helically wound retaining member for a double caged armored electromechanical cable. 4,131,757, Cl. 174-107.000.
Felkel, Edward M., to United States Steel Corporation. Double caged armored electromechanical cable. 4,131,758, Cl. 174-107.000.
Felkel, Edward M., to United States Steel Corporation. Slip sleeve mechanism for a strength tapered caged armored electromechanical cable. 4,131,759, Cl. 174-107.000.
Fender, Derek H.; and Koblasz, Arthur J., to California Institute of Technology. ERG analysis system. 4,131,113, Cl. 128-2.00T.
Feng, Bai-Cwo; and Feng, George C., to International Business Machines Corporation. Method of manufacturing self-aligned semiconductor devices. 4,131,497, Cl. 148-187.000.
Feng, George C.: *See—*
Feng, Bai-Cwo; and Feng, George C., 4,131,497, Cl. 148-187.000.
Fengler, Harald: *See—*
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Ferar, Montgomery: *See—*
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Ferguson, Wilfred J., to United States of America, Navy. Armor plate. 4,131,053, Cl. 89-36.00A.
Ferland, Jean-Marie; Laliberte, Real; Lippman, Wilbur; and Pugsley, Thomas A., to Ayerst, McKenna & Harrison, Ltd. Aryloxy aminobutanols, their preparation and use thereof. 4,131,745, Cl. 560-252.000.
Ferrara, Louis T. Serum separation device. 4,131,549, Cl. 210-359.000.
Ferro, Jose V.; Morales, Vincent M.; and Reid, Billy G. Locking valve. 4,131,127, Cl. 137-384.600.
Fett, Kurt: *See—*
Koenig, Karl-Heinz; Schirmer, Ulrich; Wuerzer, Bruno; and Fett, Kurt, 4,131,751, Cl. 560-29.000.
Fetzer, Gunter: *See—*
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F'Geppert, Erwin, to United States of America, Army. Engine mount. 4,131,256, Cl. 248-3.000.
Fiat-Allis Construction Machinery, Inc.: *See—*
Boersma, Richard F., 4,131,173, Cl. 180-90.000.
Rockwell, Harvey W., 4,131,056, Cl. 91-492.000.
FIAT Societa per Azioni: *See—*
Amedei, Giuseppe; Rivetti, Enrico; and Bertone, Antonino, 4,130,990, Cl. 60-422.000.
Fiber Materials, Inc.: *See—*
Moores, Peter R.; and Shoffner, James E., 4,131,708, Cl. 428-257.000.
Fields, Thomas L.: *See—*
Lang, Stanley A., Jr.; Fabio, Paul F.; Lin, Yang-I; Murdock, Keith C; and Fields, Thomas L., 4,131,676, Cl. 424-248.560.
Firestone, Raymond A. Device for controlling gas flow into vessels. 4,131,129, Cl. 137-596.120.
Firestone Tire & Rubber Company, The: *See—*
Roberts, Durward T., Jr., 4,131,149, Cl. 152-357.00A.
Firth, Ronald R.; and Horak, Jerry R., to Eastman Kodak Company. Edge guide for cooperation with a coaxial reel cassette. 4,131,925, Cl. 360-130.000.
Fischer, Edward F., to Federal Paper Board Co., Inc. Light bulb package. 4,131,198, Cl. 206-419.000.
Fischer, Gunther; Wenzel, Beate; Scheithauer, Steffen; Franz, Udo; Junge, Karl-Wilhelm; Schroter, Christof; Gahler, Siegfried; and Morgenstern, Johannes, to VEB Filmfabrik Wolfen. Process for the stabilization and antifogging of photographic silver halide emulsions. 4,131,470, Cl. 96-107.000.
Fischer, Hannes: *See—*
Mummenthey, Hans-Dieter; and Fischer, Hannes, 4,131,579, Cl. 260-22.0EP.
Fischer, Johanna: *See—*
Zirngibl, Ludwig; Fischer, Johanna; and Thiele, Kurt, 4,131,608, Cl. 260-307.00D.
Fischer, Robert L., to Caterpillar Tractor Co. Tree shear assembly with toggle linkage. 4,131,144, Cl. 144-34.00E.
Fisher, Leslie G., to Guest, Keen & Nettlefolds, Limited. Splined joints. 4,131,375, Cl. 403-13.000.
Fiske, Kenton W.: *See—*
Gillett, Kenneth; Steiner, Edward L.; Fiske, Kenton W.; Davis, Kenneth A.; Kukucka, William P.; Criswell, Thomas; and Richardson, Philip, 4,131,942, Cl. 364-200.000.
Richardson, Philip; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; and Criswell, Thomas, 4,131,945, Cl. 364-200.000.
Fitzgerald, Maurice J., to Polaroid Corporation. Synthetic polymeric silver halide peptizer. 4,131,471, Cl. 96-114.000.
Fiziko-Energeticheskiy Institut Akademii Nauk Latviiskoi SSR: *See—*
Apsit, Voldemar V.; Sika, Zigurd K.; and Kurkalov, Ivan I., 4,131,811, Cl. 310-12.000.
Flanigan, David A., to Thiokol Corporation. Low smoke propellant. 4,131,499, Cl. 149-19.300.
Flatt, Richard P., to RTE Corporation. Current interchange for a gas actuated bushing. 4,131,329, Cl. 339-111.000.
Fleck, Henry: *See—*
Jamison, Will B.; and Fleck, Henry, 4,131,317, Cl. 299-31.000.
Flegel, George J.; Mielbeck, Roger L.; and Pizarek, Patrick J., to Josam Manufacturing Co. Squat-type water closet. 4,130,907, Cl. 4-300.000.
Fleming, Ron J.: *See—*
Husome, Robert G.; Fleming, Ron J.; and Swanson, Ron E., 4,131,540, Cl. 209-582.000.
Fletcher, Steven J.; Wright, Jeffrey L.; and Davis, Richard S., to Sperry Rand Corporation. Word processor apparatus having means for recording a tab function as a signal indicative of the number of spaces tabbed. 4,131,949, Cl. 364-900.000.
Flinn, Robert W.; and Robinson, Roy D., to American Greetings Corporation. Candle manufacturing system and method. 4,131,415, Cl. 264-138.000.
Flores, Salomon S. Universal winding arbor. 4,131,242, Cl. 242-1.000.
Flowers, Thomas A.; Marra, Anthony W.; and Vinch, Samuel D., to Allen Industries, Inc. Method of making a multiple-density fibrous acoustical panel. 4,131,664, Cl. 264-510.000.
Floyd, Middleton B., Jr.; Weiss, Martin J.; Gredeinskas, Charles V.; and Chen, Sow-mei C., to American Cyanamid Company. 15-Deoxy-16-hydroxy-16-substituted-3-thia-prostanoic acids. 4,131,737, Cl. 560-121.000.
FMC Corporation: *See—*
Joseph, George L., 4,131,491, Cl. 148-12.00B.
Lutz, Charles W.; and Cohen, Leon E., 4,131,562, Cl. 252-186.000.
Fones, Theodore H.: *See—*
Crumrine, Albert W., Jr.; Fones, Theodore H.; Kostas, James M.; and Vanderburg, Raymond M., 4,131,156, Cl. 165-51.000.
Fontenot, Carl E., to Bass Handler Products Co., Inc. Fishing rod and handle. 4,130,960, Cl. 43-18.00R.
Forbes, Richard L., 2nd, to Xerox Corporation. Sequentially activated development system for an electrophotographic printer. 4,131,357, Cl. 355-3.0DD.
Ford Motor Company: *See—*
Holka, Thomas C.; Chabot, James V.; and Haddad, Charles, 4,131,308, Cl. 296-1.00S.
Forlow, John K.: *See—*
Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., 4,131,054, Cl. 90-11.00D.
Forss, Magnus R. Direction indicating device. 4,131,366, Cl. 356-140.000.
Foseco International Limited: *See—*
Bowers, John W., 4,131,262, Cl. 249-202.000.
Foseco Trading AG: *See—*
Ruddle, Ronald W.; and Neat, Frank, 4,131,152, Cl. 164-359.000.
Fosroc Holdings (U.K.) Limited: *See—*
McCurrich, Lawrence H.; and Lammiman, Steven A., 4,131,480, Cl. 106-93.000.
Foster, Gene B.; and Baker, Charles M., to Boeing Company, The. Semiautomatic control system for tube bending machine. 4,131,003, Cl. 72-7.000.
Fox, Norman J.: *See—*
Koehlinger, Allen W.; and Fox, Norman J., 4,131,230, Cl. 229-40.000.

Fram Corporation: *See—*
Randall, Everett H., 4,131,441, Cl. 55-385.00R.
Frame, Charles W.: *See—*
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Franke, Kurt, to Siemens Aktiengesellschaft. X-ray diagnostic installation for fluoroscopy and photography. 4,131,797, Cl. 250-322.000.
Frankel, Lawrence S., to Rohm and Haas Company. Use of chelated metal catalysts for acid/epoxy polymer systems. 4,131,715, Cl. 428-413.000.
Franks, Peter. Swinging cup holder. 4,131,259, Cl. 248-311.10R.
Frantz, Earl L., to Carpenter Technology Corporation. High-strength, high-expansion manganese alloy. 4,131,457, Cl. 75-134.00M.
Frantz, Lanier, to Graham-White Sales Corporation. Pneumatic compactor for particulate desiccant. 4,131,442, Cl. 55-387.000.
Franz, John E., to Monsanto Company. N-Organo-N-phosphonomethylglycine-N-oxides and phytotoxicant compositions containing same. 4,131,448, Cl. 71-86.000.
Franz, Udo: *See—*
Fischer, Gunther; Wenzel, Beate; Scheithauer, Steffen; Franz, Udo; Junge, Karl-Wilhelm; Schroter, Christof; Gahler, Siegfried; and Morgenstern, Johannes, 4,131,470, Cl. 96-107.000.
Freeburg, Thomas A.; Joglekar, Manohar A.; and Pajakowski, Lawrence R., to Motorola, Inc. Two-way mobile radio voice/data shared communications system. 4,131,849, Cl. 325-54.000.
French, Park; and Conaway, William H., to Sterndent Corporation. Tristimulus colormeter with internal reflectance compensation. 4,131,367, Cl. 356-405.000.
Fresquez, George A. Tools for making impressions in hardenable materials. 4,131,406, Cl. 425-385.000.
Friedman, Horace A.; Toth, Louis M.; and Bell, Jimmy T., to United States of America, Energy. Method for selectively reducing plutonium values by a photochemical process. 4,131,527, Cl. 204-157.10R.
Frisch, Paul P., to Dayco Corporation. Valve construction. 4,131,131, Cl. 137-559.000.
Fromson, Howard A. Process for anodizing aluminum. 4,131,518, Cl. 204-38.00A.
Fuji Photo Film Co., Ltd.: *See—*
Miyazako, Takushi; Sakaguchi, Shinji; Hanai, Sosuke; and Karino, Yukio, 4,131,469, Cl. 96-77.000.
Tsuboi, Masayoshi; Suzuki, Yoshiaki; and Tabei, Masatoshi, 4,131,463, Cl. 96-1.00E.
Fuji Xerox Co., Ltd.: *See—*
Takenouchi, Matsuo, 4,131,795, Cl. 250-315.00A.
Fujine, Nobuhiko; and Nakajima, Masato, to Nippon Electric Company, Ltd. Hermetically sealed opto-electrical semiconductor device. 4,131,911, Cl. 357-74.000.
Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takashima, Toshiyuki, 4,131,681, Cl. 424-267.000.
Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; Manaka, Nobuzi; and Ezoe, Mituhiko, to Nissan Motor Company, Ltd. Electronic closed loop air-fuel ratio control system. 4,131,089, Cl. 123-32.0EE.
Fujita, Keiki: *See—*
Sasaki, Minoru; Ito, Kaoru; Minamida, Katsuhiro; and Fujita, Keiki, 4,131,668, Cl. 264-40.400.
Fujita, Takanori: *See—*
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Fulbrook, William J., to Hedin Limited. Electric heater. 4,131,788, Cl. 219-535.000.
Fuller Company: *See—*
Kramm, Douglass J.; Lawall, Thomas R.; and Talago, Paul, 4,131,418, Cl. 432-80.000.
Fung, Shun C.; and Pan, Yen-Chi, to Electric Power Research Institute, Inc. Electrolytic cell having a novel electrode including platinum on a carbon support activated with a phosphorus-oxygen-containing compound. 4,131,721, Cl. 429-13.000.
Funke, Karl-Heinz: *See—*
Hilgendorf, Joachim; and Funke, Karl-Heinz, 4,131,870, Cl. 338-183.000.
Furst, Andor: *See—*
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, 4,131,655, Cl. 260-946.000.
Furutu, Akira, to Japan Bano'K Co., Ltd. Hand labeller. 4,131,504, Cl. 156-384.000.
Fushimi, Shingi; and Miyata, Takeshi, to Nissan Motor Company, Ltd. Steel article having a nitrided and partly oxidized surface and method for producing same. 4,131,492, Cl. 148-16.600.
Fyot, Jean-Jacques, to Thomson-CSF. Power amplifier arrangement automatically matched to service conditions. 4,131,860, Cl. 330-279.000.
G. Rau: *See—*
Spengler, Heinz, 4,131,720, Cl. 428-619.000.
GAF Corporation: *See—*
Edwards, Lars T.; and Trowbridge, Lyle N., 4,131,455, Cl. 75-118.00R.
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Gailey, J. Lynn: *See—*
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Galvin, Aaron A., to American District Telegraph Company. Dual projected-beam smoke detector. 4,131,888, Cl. 340-630.000.
Gamblin, Rodger L., to Mead Corporation, The. Interlacing recorder. 4,131,898, Cl. 346-75.000.
Gandini, Mario, to DURST AG Fabrik Fototechnischer Apparate. Light-mixing compartment for a light projector. 4,131,362, Cl. 355-71.000.
Gandy, Eleanor J.; and Lockhart, Ann H. Arm wrestling device. 4,131,275, Cl. 273-1.00R.
Garconnet, Michel J. Tightening force limiting device. 4,131,039, Cl. 81-52.40R.
Gardner, Ian P.: *See—*
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Garlock Inc.: *See—*
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Denton, Dennis N.; and Boyd, David G., 4,131,285, Cl. 277-1.000.
Garrett Corporation, The: *See—*
Perrone, George L.; Boorman, Robert W.; Holbrook, Michael R.; and Zanelli, Eugene A., 4,131,389, Cl. 415-211.000.
Gaunt, Charles J. TV Antenna. 4,131,897, Cl. 343-908.000.
Gauthier, Francis: *See—*
Dubost, Rene; Gauthier, Francis; and Mignien, Georges, 4,131,404, Cl. 425-129.00R.
Gavrilenko, Alexandr F.: *See—*
Lakernik, Mark M.; Shabalina, Roza I.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Golovachev, Anatoly I.; and Egorova, Tatyana S., 4,131,451, Cl. 75-14.000.
Gellatly, Grant; and Uhl, Richard G., to Philip Morris Incorporated. Method for removal of potassium nitrate from tobacco extracts. 4,131,118, Cl. 131-140.00C.
Gellatly, Grant: *See—*
Kite, George F.; Gellatly, Grant; and Uhl, Richard G., 4,131,117, Cl. 131-140.00C.
Gemp, Robert S., to Westinghouse Electric Corp. Symmetrical phase shifting apparatus, digital delaying device used therein and harmonic neutralized inverter system using the apparatus. 4,131,936, Cl. 363-43.000.
General Electric Company: *See—*
Abolins, Visvaldis; and Lee, Gim F., Jr., 4,131,598, Cl. 260-42.180.
Cipolla, Thomas M., 4,131,192, Cl. 198-469.000.
Donahoo, Joe T., 4,131,814, Cl. 310-172.000.
Dunn, Bruce S., 4,131,694, Cl. 427-126.000.
Graves, James A., 4,131,819, Cl. 313-331.000.
Haag, Donald L.; and Woods, Lee O., 4,131,871, Cl. 338-220.000.
Harris, Lawson P., 4,131,826, Cl. 315-234.000.
Kazin, Stephen B.; and Matta, Ram K., 4,131,387, Cl. 415-119.000.
Lego, Louis J., Jr., 4,131,791, Cl. 250-199.000.
Smith, Alfred H., Jr., 4,131,588, Cl. 260-37.0SB.
Smith, Alfred H., Jr., 4,131,589, Cl. 260-37.0SB.
Sugalski, Raymond K., 4,131,722, Cl. 429-55.000.
Svec, Paul S., 4,131,475, Cl. 106-38.300.
Walker, Wendell C., 4,130,954, Cl. 38-77.830.
General Home Products Corporation: *See—*
Malecki, Alexander J., 4,131,205, Cl. 211-200.000.
General Kinematics Corporation: *See—*
Musschoot, Albert, 4,131,193, Cl. 198-533.000.
General Motors Corporation: *See—*
DeVinney, Robert E., 4,131,101, Cl. 123-195.00C.
Stewart, John A.; and Nichols, Wayne C., 4,131,877, Cl. 340-58.000.
Geohegan, Kenneth P., Jr., to Westinghouse Electric Corp. Inertial balanced dipole hydrophone. 4,131,874, Cl. 340-10.000.
Gerber, Heinz J.; and Logan, David J., to Gerber Scientific Instrument Company, The. Detachable indexing device and method. 4,131,224, Cl. 226-8.000.
Gerber Scientific Instrument Company, The: *See—*
Gerber, Heinz J.; and Logan, David J., 4,131,224, Cl. 226-8.000.
Gerbruder Kommerling Kunststoffwerke G.m.b.H.: *See—*
Kesseler, Helmut; Anstadt, Gerd L.; and Kiefer, Hermann, 4,130,976, Cl. 52-656.000.
Gerro Gerhard Rohland AB: *See—*
Rohland, Gerhard, 4,131,377, Cl. 403-14.000.
Gerstenmaier, William J.; and Todd, John A., to Dresser Industries, Inc. Leak detection system and method for fluid delivery piping. 4,131,216, Cl. 222-52.000.
Gianelo, Angelo. Door latch. 4,131,002, Cl. 70-84.000.
Gibson, Murray. Methods of pipeline construction in arctic and subarctic regions. 4,130,925, Cl. 29-407.000.
Gieles, Antonous C. M., to U.S. Philips Corporation. Manufacture of semiconductor devices. 4,131,524, Cl. 204-129.300.
Gilbert, Frederick W.: *See—*
Rose, Charles D.; and Gilbert, Frederick W., 4,131,538, Cl. 208-352.000.
Gillett, Kenneth; Steiner, Edward L.; Fiske, Kenton W.; Davis, Kenneth A.; Kukucka, William P.; Criswell, Thomas; and Richardson, Philip, to Xerox Corporation. Non-volatile storage module for a controller. 4,131,942, Cl. 364-200.000.
Gilman Manufacturing Corporation: *See—*
Gilman, Stanley H.; and Marcus, Daniel M., 4,131,028, Cl. 74-25.000.
Gilman, Stanley H.; and Marcus, Daniel M., to Gilman Manufacturing

Corporation. Motion conversion mechanism. 4,131,028, Cl. 74-25.( ).
Girling Limited: *See*—
Bayliss, John P., 4,131,325, Cl. 303-93.000.
Gironi, Roberto: *See*—
Bertazzoli, Guido; Gironi, Roberto; and Resentini, Angelo, 4,131,148, Cl. 152-209.00B.
Gitlin, Harvey. Tamperproof coin box closure. 4,131,190, Cl. 194-1.00B.
Giusto, Pietro P., to CSELT - Centro Studi e Laboratori Telecomunicazioni. Method of and means for conveying and recovering supplementary message signals superimposed upon a multilevel signal stream in a digital transmission system. 4,131,761, Cl. 179-15.0BY.
Glassmeyer, John J., to Pullman Incorporated. Cargo transportation device. 4,131,071, Cl. 108-53.100.
Gleason, John G., to SmithKline Corporation. 7β-Acyloxy-3-heterocyclicthiomethyl cephalosporins. 4,131,734, Cl. 544-26.000.
Gocho, Choichi, to Tokyo Shibaura Denki K.K. Electric power converting apparatus for use in battery cars. 4,131,829, Cl. 318-139.000.
Godai, Tomokazu: *See*—
Kimura, Shinji; Godai, Tomokazu; Minato, Shoji; Kobayashi, Minoru; Yamaga, Makoto; Maki, Shingo; Hashimoto, Yoshizo; Suga, Tetsuo; and Saita, Hiroshi, 4,131,784, Cl. 219-137.0WM.
Godbout, Emil E. Device for melting ice at a fish hole in the ice. 4,131,107, Cl. 126-271.20R.
Golden, Donald M. G. R., deceased: *See*—
Lloyd, Robert G.; Street, Anthony C.; and Golden, Donald M. G. R., deceased, 4,131,251, Cl. 244-137.00R.
Golden, Jean J., executrix: *See*—
Lloyd, Robert G.; Street, Anthony C.; and Golden, Donald M. G. R., deceased, 4,131,251, Cl. 244-137.00R.
Goldenberg, Joseph, to Pap-et, Inc. Game racket with semi-resilient impact surfaces and an offset handle. 4,131,278, Cl. 273-67.00R.
Golovachev, Anatoly I.: *See*—
Lakernik, Mark M.; Shabalina, Roza I.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Golovachev, Anatoly I.; and Egorova, Tatyana S., 4,131,451, Cl. 75-14.000.
Gonzalez, Francisco. Catalytic composition for internal combustion engines, furnaces and boilers. 4,131,434, Cl. 44-62.000.
Goodbary, Edgar R.; and Bartley, Francis A., to Goodbary Engineering Company. Dual steering system for vehicles. 4,131,177, Cl. 180-133.000.
Goodbary Engineering Company: *See*—
Goodbary, Edgar R.; and Bartley, Francis A., 4,131,177, Cl. 180-133.000.
Goodyear Tire & Rubber Company, The: *See*—
Lovell, John A.; Hillegass, Donald V.; and Harris, Philip G., 4,131,667, Cl. 264-571.000.
von der Heyde, Richard C.; and Head, William J., 4,130,928, Cl. 29-450.000.
Wideman, Lawson G., 4,131,627, Cl. 260-666.00A.
Wideman, Lawson G.; and Ofstead, Eilert A., 4,131,629, Cl. 260-666.00A.
Gordon, Manfred; and Ready, Bernard W. Centrifugal homogenizer. 4,131,369, Cl. 366-146.000.
Gordon, Michael D.: *See*—
Davis, William R.; and Gordon, Michael D., 4,131,624, Cl. 260-606.50P.
Gordy, Donald G.; and Klosterman, David P., to Orscheln Lever Sales Co. Self-retaining conduit anchoring device. 4,131,379, Cl. 403-197.000.
Gosser, Lawrence W., to Du Pont de Nemours, E. I., and Company. Preparation of hydrogen peroxide from dihydroanthracene hydroperoxides. 4,131,646, Cl. 423-591.000.
Gotchel, Joel P.; and Norton, Henry J., to Scott Paper Company. Carding operation for forming a fibrous structure. 4,130,915, Cl. 19-304.000.
Goto, Kenji: *See*—
Sawada, Daisaku; Goto, Kenji; Shigemaut, Takashi; Takeda, Yuji; Hattori, Tadashi; Yamaguchi, Hiroaki; and Nishida, Minoru, 4,131,097, Cl. 123-117.00R.
Gotto, Raymond J. Method to prevent unauthorized use of cassette tape recorders and a device according to the method. 4,131,001, Cl. 70-14.000.
Gotzenberger, Rudibert, to Ernst Flitsch GmbH U. Co. Control valve. 4,131,128, Cl. 137-556.000.
Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbrini, Riccardo, to Montedison S.p.A. Adducts of carbamoyl sulphoxides. 4,131,621, Cl. 260-551.00C.
Grabmaier, Josef: *See*—
Aulich, Hubert; and Grabmaier, Josef, 4,131,447, Cl. 65-325.000.
Graf, Ronald E. Sunlight admitting heat impeding panel. 4,131,706, Cl. 428-116.000.
Graham, Robert H., to R. A. Pearson Company. End tab folding mechanism for cartons. 4,131,058, Cl. 93-49.00R.
Graham-White Sales Corporation: *See*—
Frantz, Lanier, 4,131,442, Cl. 55-387.000.
Granda, Edward J.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,131,687, Cl. 426-3.000.
Granger Associates: *See*—
Narasimha, Madihally J., 4,131,766, Cl. 179-15.0FD.
Grapes, Eugene F.: *See*—
Patterson, William W., III; and Grapes, Eugene F., 4,131,264, Cl. 254-67.000.
Graves, James A., to General Electric Company. Lead wires for incandescent lamp. 4,131,819, Cl. 313-331.000.
Gray, Kenneth W., to National Research Development Corporation. Miniature doppler radar systems and microwave receivers suitable therefor. 4,131,889, Cl. 343-8.000.
Greber, Gerd: *See*—
Kvita, Vratislav; Darms, Roland; and Greber, Gerd, 4,131,613, Cl. 260-343.30R.
Gredeinskas, Charles V.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Gredeinskas, Charles V.; and Chen, Sow-mei C., 4,131,737, Cl. 560-121.000.
Green, Harry S. Seawater distillation apparatus. 4,131,513, Cl. 202-185.00B.
Greene, Shelly M. Mirror cleaning device. 4,130,909, Cl. 15-104.920.
Gregg, Harry D., Jr.: *See*—
Miller, Ralph; and Gregg, Harry D., Jr., 4,131,642, Cl. 423-193.000.
Gretag Aktiengesellschaft: *See*—
Ehrat, Kurt, 4,131,879, Cl. 340-146.30H.
Grieshaber, Hermann: *See*—
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Griesing, John E.: *See*—
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Griesshammer, Rudolf: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,131,659, Cl. 264-25.000.
Grosclaude, Gerard; Regnier, Jean; and Cavarroc, Marcel, to Institut National de la Recherche Agronomique. Continuous manufacture of cheese. 4,131,688, Cl. 426-40.000.
Gruczelak, Norman P., to Okidata Corporation. Head positioning system for disc files. 4,131,921, Cl. 360-86.000.
Grzywa, Edward: *See*—
Kiedik, Maciej; Grzywa, Edward; Kolt, Jozef; Terelak, Kazimierz; Czyz, Jerzy; and Niezgoda, Anna, 4,131,749, Cl. 568-781.000.
GTE Sylvania Incorporated: *See*—
Ball, George A., Jr.; and Simpson, George H., 4,131,657, Cl. 261-39.00E.
Dombrowski, Joseph A.; Baxter, Clement T.; Howard, Frederick B.; and Simpson, George H., 4,131,868, Cl. 337-113.000.
Gueguen, Jacques: *See*—
Petit, Leon; Davin, Andre; and Gueguen, Jacques, 4,131,607, Cl. 260-123.500.
Guest, Keen & Nettlefolds, Limited: *See*—
Fisher, Leslie G., 4,131,375, Cl. 403-13.000.
Gugel, Georg: *See*—
Muller, Otto; Gugel, Georg; and Kastl, Hans, 4,131,018, Cl. 73-432.00R.
Guglielmo, Richard J., Sr. Composition of matter for treating a closed cell foam substrate. 4,131,700, Cl. 427-322.000.
Gulf Oil Canada Limited: *See*—
Porteous, Kenneth, 4,131,535, Cl. 208-11.0LE.
Gulf & Western Industries, Inc.: *See*—
Battle, Francis L., 4,131,848, Cl. 324-236.000.
Gunderson, Richard H.; and Ilfrey, William T., to Exxon Production Research Company. Annular seal. 4,131,287, Cl. 277-191.000.
Gurevich, Samuil M.; Zamkov, Vadim N.; and Prilutsky, Valery P. Flux-cored welding wire. 4,131,493, Cl. 148-23.000.
Gurney, Ferdinand J.: *See*—
De Pierre, Vincent; and Gurney, Ferdinand J., 4,131,461, Cl. 75-208.0CS.
Gusmer Corporation: *See*—
Gusmer, Frederick E.; Commette, Denis S.; and Bairunas, Robert A., 4,131,395, Cl. 417-271.000.
Gusmer, Frederick E.; Commette, Denis S.; and Bairunas, Robert A., to Gusmer Corporation. Feeder for apparatus for ejecting a mixture of a plurality of liquids. 4,131,395, Cl. 417-271.000.
Gustavsson, Lennart, to AB Svenska Flaktfabriken. Apparatus for forming and controlling currents of air. 4,131,059, Cl. 98-36.000.
Gustavsson, Stig O. S., to Ingestrom, Curt Holger. Building block. 4,130,973, Cl. 52-309.170.
Gutridge, Jack E. Gun sight. 4,130,958, Cl. 42-1.00S.
Gyi, Ko K.: *See*—
Behr, Michael I.; Gyi, Ko K.; Iwan, Wilfred D.; and Palotay, Joseph C., 4,131,924, Cl. 360-106.000.
H. Bieri AG Liebefeld: *See*—
Chromik, Karel, 4,131,126, Cl. 137-270.000.
H. R. Turner (Willenhall) Limited: *See*—
Pallant, Joseph; and Johndrow, John P., 4,131,316, Cl. 297-341.000.
Haag, Donald L.; and Woods, Lee O., to General Electric Company. Electrical device and method. 4,131,871, Cl. 338-220.000.
Haar, Darrell: *See*—
Schulster, Joseph P.; Halbach, Stephen N.; Haar, Darrell; and Crawford, Theron L., 4,131,408, Cl. 425-410.000.
Haas, Lothar: *See*—
Weckenmann, Albert; Brauticam, Rolf; and Haas, Lothar, 4,131,772, Cl. 200-61.540.
Haddad, Charles: *See*—
Holka, Thomas C.; Chabot, James V.; and Haddad, Charles, 4,131,308, Cl. 296-1.00S.
Hagiwara, Teruo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Selective mode angle finder for SLR camera. 4,131,354, Cl. 354-224.000.
Hague, Wilmer W.; and Frame, Charles W., to Chambersburg Engineering Company. Adaptive valve control system for an impact device. 4,131,164, Cl. 173-1.000.

Haidlen, Friedrich, to Kraftwerk Union Aktiengesellschaft. Pressure relief device for a nuclear reactor containment building. 4,131,509, Cl. 176-38.000.

Haines, Paul G.: *See—*
Popoff, Ivan C.; and Haines, Paul G., 4,131,622, Cl. 260-576.000.

Halbach, Stephen N.: *See—*
Sehulster, Joseph P.; Halbach, Stephen N.; Haar, Darrell; and Crawford, Theron L., 4,131,408, Cl. 425-410.000.

Hall, J. James A. Torque lug drive. 4,131,321, Cl. 301-6.00A.

Hall, John B.; and Weigers, Wilhelmus J., to International Flavors & Fragrances Inc. Detergent composition. 4,131,555, Cl. 252-89.00R.

Hall, John B.; and Wiegers, Wilhelmus J., to International Flavors & Fragrances Inc. Soap composition. 4,131,557, Cl. 252-132.000.

Hall, Warren L.: *See—*
Mager, George E.; Nelson, Frank M.; and Hall, Warren L., 4,131,944, Cl. 364-200.000.

Hamagawa, Hiroshi, to Toyo Jihoki Manufacturing Co., Ltd. Digital time signalling device. 4,131,855, Cl. 328-129.000.

Hammer, George P.: *See—*
Blackburn, Samuel S., Jr.; and Hammer, George P., 4,131,073, Cl. 110-106.000.

Hamprecht, Gerhard, to BASF Aktiengesellschaft. Sulfamic acid halides and their manufacture. 4,131,620, Cl. 260-543.00R.

Hampton, Marshall D. Theft-proof sign. 4,130,957, Cl. 40-607.000.

Hanai, Sosuke: *See—*
Miyazako, Takushi; Sakaguchi, Shinji; Hanai, Sosuke; and Karino, Yukio, 4,131,469, Cl. 96-77.000.

Hanari, Izumi: *See—*
Yoshida, Yoshinori; Kobayashi, Tutomu; Shinohara, Hironobu; and Hanari, Izumi, 4,131,743, Cl. 560-244.000.

Handke, Paul C.: *See—*
Ryan, Frederick M.; and Handke, Paul C., 4,131,064, Cl. 102-1.00R.

Hanes Corporation: *See—*
Whittaker, Roger L.; and Hewitt, Clyde, 4,130,999, Cl. 66-145.00R.

Hanes, Maurice H.; and Lowry, Lewis R., to Electric Power Research Institute, Inc. Light-triggered thyristor and package therefore. 4,131,905, Cl. 357-30.000.

Hansel, William B., to Sun Oil Company of Pennsylvania. Dispenser with additive option. 4,131,215, Cl. 222-26.000.

Hansen, Kent W.: *See—*
Davis, Earl K.; and Hansen, Kent W., 4,131,478, Cl. 106-53.000.

Hansen, Lyle K. Console gun rack. 4,131,202, Cl. 211-2.000.

Hanson, Leon C.: *See—*
Hanson, Robert C.; and Hanson, Leon C., 4,131,084, Cl. 122-33.000.

Hanson, Robert C.; and Hanson, Leon C., to Energy Systems, Incorporated. Upright direct fired water bath propane vaporizer. 4,131,084, Cl. 122-33.000.

Hara, Kunio; and Yoshida, Kohsaku, to Nichi-Ei Bussan Co., Ltd. Apparatus for continuously fixing a plurality of tubular fasteners one by one to a plurality of apertures provided in a support panel. 4,131,009, Cl. 72-391.000.

Hara, Toshitsugu; Abe, Yoritsune; Ootuka, Katsuji; Kashiwabara, Yasushige; Oshiyama, Hiroichi; Yanadori, Michio; Kato, Eisaku; and Okazaki, Kichizaemon, to Hitachi, Ltd. Refrigerator. 4,130,997, Cl. 62-504.000.

Harada, Tamotsu: *See—*
Oishi, Akiyoshi; Harada, Tamotsu; and Ishikawa, Takashi, 4,131,490, Cl. 148-9.500.

Harbaugh, Steven K.; and Mitchell, Frank R., to Eocom Corporation. Gimballed coupling for lead screw and nut assembly. 4,131,029, Cl. 74-89.150.

Hardman, Harley F., to Standard Oil Company. Dehydrogenation of paraffins. 4,131,631, Cl. 260-683.300.

Hardy, Herbert L., to Polaroid Corporation. Motor control system for automatic processing of photographic film strips. 4,131,344, Cl. 352-130.000.

Harnach, James W.: *See—*
Thompson, Jerry L.; Deluga, Sigmund S.; Harnach, James W.; and Shamah, Eliahu, 4,131,551, Cl. 252-33.000.

Harris Corporation: *See—*
Schriber, Louis; and Blaha, John F., 4,131,047, Cl. 83-698.000.

Harris, Lawson P., to General Electric Company. Triggering circuit for triggered vacuum gaps. 4,131,826, Cl. 315-234.000.

Harris, Philip G.: *See—*
Lovell, John A.; Hillegass, Donald V.; and Harris, Philip G., 4,131,667, Cl. 264-571.000.

Harrison, Boyd L.; and Dolfini, Joseph E., to Richardson-Merrell Inc. ω-(1,3-Dithiolan-2-ımino) substituted acetic acids. 4,131,683, Cl. 424-277.000.

Hart, John S., to Allen-Bradley Company. Three pole electromagnet. 4,131,865, Cl. 335-257.000.

Hartman, Adrian R.; North, James C.; Reutlinger, George W.; and Shackle, Peter W., to Bell Telephone Laboratories, Incorporated. High voltage semiconductor devices. 4,131,910, Cl. 357-49.000.

Hartman & Braun Aktiengesellschaft: *See—*
Erb, Hans Joachim; Brandt, Jurgen; and Kirschbaum, Peter, 4,131,900, Cl. 346-162.000.

Hartnig, Richard E., to Paper Converting Machine Company. Method and apparatus for separating a continuous stream of connected business forms into exact count zig-zag folded stacks. 4,131,272, Cl. 270-73.000.

Harvey Hubbell, Incorporated: *See—*
Quiogue, Honesto D., 4,131,867, Cl. 336-65.000.

Haseba, Shigeru: *See—*
Utsunomiya, Kei; Soga, Kazuya; Shimasaki, Katsunori; Mito, Yutaka; Oaki, Mamoru; Haseba, Shigeru; Miki, Hiroetu; and Masaki, Michiko, 4,131,643, Cl. 423-239.000.

Hasebe, Morihiko: *See—*
Nishikawa, Shigeyoshi; Muroshima, Takashi; Sakaguchi, Hirokazu; Hasebe, Morihiko; Katagiri, Katsuji; and Inoue, Kazuo, 4,131,931, Cl. 361-315.000.

Hashimoto, Mitsuo; and Koguchi, Mitsuo, to Bridgestone Tire Company Limited; and Mitsui Miike Seisakusho Engineering Company Limited. Light beam projecting apparatus. 4,131,347, Cl. 353-28.000.

Hashimoto, Satoshi; Okumura, Nobuya; and Kazama, Kiyoshi, to Teijin Limited. Process for the preparation of polyesters. 4,131,601, Cl. 528-279.000.

Hashimoto, Yoshizo: *See—*
Kimura, Shinji; Godai, Tomokazu; Minato, Shoji; Kobayashi, Minoru; Yamaga, Makoto; Maki, Shingo; Hashimoto, Yoshizo; Suga, Tetsuo; and Saita, Hiroshi, 4,131,784, Cl. 219-137.0WM.

Hastings Equity Grain Bin Mfg. Co.: *See—*
Einsel, Kenneth D.; and Johnson, Roland W., 4,130,998, Cl. 64-3.000.

Hatchett, Michael R.; and Rigbey, Leonard J., to International Business Machines Corporation. Record disk cartridge. 4,131,199, Cl. 206-444.000.

Hattori, Tadashi: *See—*
Sawada, Daisaku; Goto, Kenji; Shigemaut, Takashi; Takeda, Yuji; Hattori, Tadashi; Yamaguchi, Hiroaki; and Nishida, Minoru, 4,131,097, Cl. 123-117.00R.

Hauck, Frederic P.: *See—*
Sundeen, Joseph E.; and Hauck, Frederic P., 4,131,744, Cl. 560-252.000.

Hauni-Werke Korber & Co. KG.: *See—*
Bottcher, Hubert; Pfannmuller, Joachim; Kaebernick, Hartmut; Steiniger, Wolfgang; and Preuss, Horst-Dieter, 4,131,501, Cl. 156-157.000.

Havlik, Vaclav. Game apparatus. 4,131,283, Cl. 273-282.000.

Hayes, John C.: *See—*
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., 4,131,628, Cl. 260-666.00A.

Head, William J.: *See—*
von der Heyde, Richard C.; and Head, William J., 4,130,928, Cl. 29-450.000.

Hedin Limited: *See—*
Fulbrook, William J., 4,131,788, Cl. 219-535.000.

Hedrick, John R., to Pevrick Engineering Company, Inc. Rotary bone cutter for shaping sockets. 4,131,116, Cl. 128-305.000.

Heinze, Richard: *See—*
Busse, Peter, 4,131,376, Cl. 403-12.000.

Heller, Jorge: *See—*
Choi, Nam S.; and Heller, Jorge, 4,131,648, Cl. 424-22.000.

Heller, Milton D.: *See—*
Bernstein, Seymour; and Heller, Milton D., 4,131,684, Cl. 424-315.000.

Hempelmann, Heinrich J.: *See—*
Beisch, Hans R.; and Hempelmann, Heinrich J., 4,131,322, Cl. 301-37.0PB.

Hengelhaupt, Hans, to Triumph Werke Nurnberg A.G. Endless fabric ribbon cassette for typewriters or like machines. 4,131,372, Cl. 400-196.100.

Henke, Lowell D. Vehicle wind deflector. 4,131,309, Cl. 296-1.00S.

Henkel, Hans-Joachim: *See—*
Michel, Alfred; Henkel, Hans-Joachim; Koch, Christian; and Kostka, Hana, 4,131,569, Cl. 252-462.000.

Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity: *See—*
Porteous, Kenneth, 4,131,535, Cl. 208-11.0LE.

Herman, Richard M.; and Batiuk, Martin, to B. F. Goodrich Company, The. Thermoplastic polymer blends comprising EPDM, E/EA copolymer and optionally P.E. 4,131,654, Cl. 260-897.00B.

Herrig, Willi. Set of structural elements for producing cupboard walls and other wall units. 4,130,971, Cl. 52-236.700.

Herschtal, Ludwik, to L M Ericsson Pty. Ltd. Bit switching of word synchronized data. 4,131,763, Cl. 179-15.0BS.

Hess, Robert L.: *See—*
Meyer, Jeffry R.; and Hess, Robert L., 4,131,775, Cl. 200-148.00R.

Hewitt, Clyde: *See—*
Whittaker, Roger L.; and Hewitt, Clyde, 4,130,999, Cl. 66-145.00R.

Highberger, Clarence. Quick connect hitch assembly. 4,131,295, Cl. 280-475.000.

Hijikata, Akiko: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,131,673, Cl. 424-247.000.

Hijikata, Masayuki: *See—*
Satoh, Mitsunori; Hijikata, Masayuki; Maeda, Hiroshi; and Morimoto, Ichiro, 4,131,458, Cl. 75-173.00R.

Hild, Werner: *See—*
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,131,563, Cl. 252-301.10W.

Hilgendorf, Joachim; and Funke, Karl-Heinz, to Preh, Elektro-Feinmechanische Werke, Jakob Preh Nachf. Slide resistor. 4,131,870, Cl. 338-183.000.

Hill, David T.; Sutton, Blaine M.; and Lantos, Ivan, to SmithKline

Corporation. Method for preparing auranofin. 4,131,732, Cl. 536-121.000.
Hill, Maynard L.; and Whyte, Theodore R., to Johns Hopkins University, The. Ionic air speed indicator. 4,131,013, Cl. 73-181.000.
Hillegass, Donald V.: *See*—
Lovell, John A.; Hillegass, Donald V.; and Harris, Philip G., 4,131,667, Cl. 264-571.000.
Hind, Robert D.; Thrower, Anthony; and Cudby, Joseph W., to United States Steel Corporation. Pouring of molten metals. 4,131,219, Cl. 222-603.000.
Hirabayashi, Yutaka: *See*—
Nomura, Masahiro; and Hirabayashi, Yutaka, 4,131,466, Cl. 96-49.000.
Hirai, Jun, to Sony Corporation. Apparatus for recording and reproducing video signals on a magnetic tape movable at different speeds. 4,131,912, Cl. 358-4.000.
Hirai, Toshihiro: *See*—
Tsujimoto, Minoru; Okada, Minoru; Suzuki, Yuji; and Hirai, Toshihiro, 4,131,528, Cl. 204-157.10R.
Hiraki, Hideaki: *See*—
Ichinose, Noboru; Ookuma, Hideo; Mizutani, Toshiaki; and Hiraki, Hideaki, 4,131,479, Cl. 106-39.500.
Hirano, Takayasu; Hisagen, Yoshiaki; Takamizawa, Minoru; and Yoshioka, Hiroshi, to Sony Corporation. Magnetic recording medium. 4,131,717, Cl. 428-447.000.
Hirata, Masakuni; and Matsuzaki, Yukio, to Nippon Oil Company Limited. Method for atomizing oil and an apparatus therefor. 4,131,658, Cl. 261-142.000.
Hirshfeld, Julian J.: *See*—
Cocoros, George; Chambers, Thomas V.; and Hirshfeld, Julian J., 4,131,424, Cl. 8-172.00R.
Hisagen, Yoshiaki: *See*—
Hirano, Takayasu; Hisagen, Yoshiaki; Takamizawa, Minoru; and Yoshioka, Hiroshi, 4,131,717, Cl. 428-447.000.
Hishinuma, Yukio: *See*—
Sato, Isao; Uchiyama, Yoshihiro; Ishibashi, Youji; Tsukahara, Satoshi; Oshima, Ryoichiro; and Hishinuma, Yukio, 4,131,432, Cl. 422-177.000.
Hitachi Heating Appliances Co., Ltd.: *See*—
Tatsukawa, Osami; Sakurai, Osamu; and Serizawa, Hisayuki, 4,131,779, Cl. 219-10.55R.
Hitachi, Ltd.: *See*—
Amano, Matsuo; Kobori, Sigeyuki; and Sugawara, Toru, 4,131,930, Cl. 361-211.000.
Hara, Toshitsugu; Abe, Yoritsune; Ootuka, Katsuji; Kashiwabara, Yasushige; Oshiyama, Hiroichi; Yanadori, Michio; Kato, Eisaku; and Okazaki, Kichizaemon, 4,130,997, Cl. 62-504.000.
Oyama, Tadao, 4,130,919, Cl. 29-25.190.
Sato, Isao; Uchiyama, Yoshihiro; Ishibashi, Youji; Tsukahara, Satoshi; Oshima, Ryoichiro; and Hishinuma, Yukio, 4,131,432, Cl. 422-177.000.
Terashima, Isamu, 4,131,081, Cl. 118-646.000.
Yoshida, Masashi; Iino, Yasuo; and Sato, Katsuya, 4,131,922, Cl. 360-90.000.
Hodakowski, Leonard E.; and Carder, Charles H., to Union Carbide Corporation. Radiation curable acrylated polyurethane. 4,131,602, Cl. 528-49.000.
Hodgkinson, Joseph B., to Pilkington Brothers Limited. Snapping of sheets of glass. 4,131,222, Cl. 225-3.000.
Hoechst Aktiengesellschaft: *See*—
Hunger, Klaus, 4,131,733, Cl. 542-406.000.
Moraw, Roland; and Schadlich, Gunther, 4,131,337, Cl. 350-3.860.
Mummenthey, Hans-Dieter; and Fischer, Hannes, 4,131,579, Cl. 260-22.0EP.
Schunck, Erich; Schmelzer, Heinz; and Sattelmeyer, Richard, 4,131,709, Cl. 428-261.000.
Hoechst, Lonnie D.: *See*—
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,131,225, Cl. 228-161.000.
Hoffman-La Roche Inc.: *See*—
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, 4,131,655, Cl. 260-946.000.
Hoffmann, Peter: *See*—
Radlmann, Eduard; Reinehr, Ulrich; Hoffmann, Peter; Arlt, Dieter; and Nischk, Gunther, 4,131,724, Cl. 526-16.000.
Hofmann, Corris M.: *See*—
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,131,611, Cl. 260-326.800.
Hofmann, Wilfried; Leuder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, to Agfa-Gevaert AG. Collapsible microfilm reader. 4,131,348, Cl. 353-72.000.
Hogan, William F., to Spectrum X-Ray Corporation. X-ray cradle top with tilting mechanism. 4,131,801, Cl. 250-439.00R.
Hogendobler, Richard S.; and Murray, Robert M., to AMP Incorporated. RF shielded blank for coaxial connector. 4,131,332, Cl. 339-177.00R.
Hohne, Karl, to Siemens Aktiengesellschaft. Method for the manufacture of a silver catalyst for electrochemical cells and the catalyst prepared by the method. 4,131,570, Cl. 252-473.000.
Holbrook, Michael R.: *See*—
Perrone, George L.; Boorman, Robert W.; Holbrook, Michael R.; and Zanelli, Eugene A., 4,131,389, Cl. 415-211.000.
Holder, Charles B.: *See*—
Lachowicz, Donald R.; and Holder, Charles B., 4,131,577, Cl. 260-17.4CL.
Holka, Thomas C.; Chabot, James V.; and Haddad, Charles, to Ford Motor Company. Self-deploying chin spoiler for a vehicle. 4,131,308, Cl. 296-1.00S.
Hollabaugh, Michael D.; and Panday, Vinod, to Clemar Manufacturing Corporation. Digital two-wire irrigation control system with feedback. 4,131,882, Cl. 340-310.00A.
Holland-Moritz, Ervin K., to United States of America, Air Force. Single dispersive delay line compressive receiver. 4,131,852, Cl. 325-363.000.
Holmes, Peter C., to Solon Manufacturing Company, The. Visual load indicator. 4,131,050, Cl. 85-62.000.
Holter, Heinz. Device for the dedusting of dust-containing gases. 4,131,439, Cl. 55-220.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Sato, Yasuhito; Tanaka, Minoru; and Nakamura, Akihisa, 4,131,092, Cl. 123-32.0ST.
Honda, Ko, to Rank Xerox Limited. Sensitive medium cleaner for use in electrophotographic copying machine. 4,131,359, Cl. 355-15.000.
Honeywell Inc.: *See*—
Lee, Tzuo-Chang; and Lin, Jacob W., 4,131,462, Cl. 96-1.50R.
Honeywell Information Systems Inc.: *See*—
Rich, Dennis E.; and Steigerwald, Conrad J., 4,131,042, Cl. 83-100.000.
Hopper, Meinolf: *See*—
Piret, Norbert L.; Hopper, Meinolf; and Kudelka, Herbert, 4,131,454, Cl. 75-83.000.
Hopper, Thomas P., to Sunworks, Inc. Solar energy collector. 4,131,111, Cl. 126-271.000.
Horak, Jerry R.: *See*—
Firth, Ronald R.; and Horak, Jerry R., 4,131,925, Cl. 360-130.000.
Hordeski, Edward R.; Canevari, Louis T.; and Macari, Leonard J., to Pitney-Bowes, Inc. Assembly fixtures for mass producible weight measuring system. 4,131,168, Cl. 177-128.000.
Hosaka, Akio: *See*—
Fujishiro, Takeshi; Aono, Shigeo; Hosaka, Akio; Asano, Masaharu; Manaka, Nobuzi; and Ezoe, Mituhiko, 4,131,089, Cl. 123-32.0EE.
Hoshiyama, Masao: *See*—
Ikezaki, Muneyoshi; Okazaki, Yashushi; Ito, Nobuo; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,131,686, Cl. 424-330.000.
Hougen, Everett D. Arbor for annular hole cutter. 4,131,384, Cl. 408-68.000.
Houshi, Teruo, to Sanyo Electric Co., Ltd.; and Toyko Sanyo Electric Co., Ltd. Apparatus for rotatively driving a turn table. 4,131,828, Cl. 318-138.000.
Howard, Frederick B.: *See*—
Dombrowski, Joseph A.; Baxter, Clement T.; Howard, Frederick B.; and Simpson, George H., 4,131,868, Cl. 337-113.000.
Howard Machinery Limited: *See*—
Clary, Roger, 4,130,982, Cl. 56-330.000.
Howe, Ralph E.: *See*—
Morley, John R.; and Howe, Ralph E., 4,131,691, Cl. 427-41.000.
Hsieh, Henry L.; and Udipi, Kishore, to Phillips Petroleum Company. Epoxidized block copolymers. 4,131,653, Cl. 260-880.00B.
Hucker, David J.; and Schmitz, Norbert L., to Sundstrand Corporation. Static voltage balancer. 4,131,844, Cl. 323-45.000.
Hudson, Barry, to BP Chemicals Limited. Cobalt-catalyzed oxidation of hydrocarbons. 4,131,742, Cl. 560-241.000.
Hudson, Barry: *See*—
Bartlett, John S.; and Hudson, Barry, 4,131,741, Cl. 560-241.000.
Huffman, George W., to Eli Lilly and Company. Method for treating methicillin resistant *Staphylococcus aureus*. 4,131,672, Cl. 424-246.000.
Huffnagle, Clifton W.: *See*—
Asick, John C.; and Huffnagle, Clifton W., 4,130,934, Cl. 29-628.000.
Hughes Company, Inc.: *See*—
Kumandan, Ramakrishnarao K., 4,131,062, Cl. 99-638.000.
Hughes, Leroy A. Utensil for making pizzas. 4,131,080, Cl. 118-13.000.
Hughes, William B., to Phillips Petroleum Company. Isomerization process. 4,131,630, Cl. 260-666.0PY.
Hugli, Hans W.; and Kubler, John M., to Sundstrand Data Control, Inc. Accelerometer. 4,131,020, Cl. 73-517.00B.
Hultsch, Gunther; and Bock, Harald, to Krauss-Maffei Aktiengesellschaft. Centrifugal fluidized-bed drying method and apparatus. 4,130,944, Cl. 34-8.000.
Hummel, Jerry R.: *See*—
Trabbold, Harold J.; and Hummel, Jerry R., 4,131,780, Cl. 219-70.000.
Humphrey, William E., to Optical Research and Development Corporation. Optical stabilizer having space referenced motion. 4,131,333, Cl. 350-16.000.
Humphris, Colin J.: *See*—
Drake, Paul H.; Humphris, Colin J.; and Preedy, John E., 4,131,481, Cl. 521-91.000.
Hunger, Klaus, to Hoechst Aktiengesellschaft. Water-insoluble azomethine compounds. 4,131,733, Cl. 542-406.000.
Hunt, Barbara P.: *See*—
Burke, Oliver W., Jr.; and Hunt, Barbara P., 4,131,584, Cl. 260-29.60N.
Hurkmans, Gerardus C. A. M.: *See*—
van den Berg, Henrikus J.; and Hurkmans, Gerardus C. A. M., 4,130,903, Cl. 2-8.000.
Husome, Robert G.; Fleming, Ron J.; and Swanson, Ron E., to Johnson Farm Machinery Co. Inc.; and Acurex Corporation. Color sorting system. 4,131,540, Cl. 209-582.000.
Huwe, Donald D. Adaptor for manual lawn and garden sprinkler valves. 4,131,133, Cl. 137-624.110.

Hydraform Products Corp.: *See*—
Choate, James R., 4,131,104, Cl. 126-60.000.
Hydroacoustics, Inc.: *See*—
Bouyoucos, John V., 4,131,178, Cl. 181-120.000.
Hymo, Lawrence A. Expansion joints. 4,131,382, Cl. 404-69.000.
Ichinose, Noboru; Ookuma, Hideo; Mizutani, Toshiaki; and Hiraki, Hideaki, to Tokyo Shibaura Electric Co., Ltd. Transparent ceramics. 4,131,479, Cl. 106-39.500.
Iddon Brothers Limited: *See*—
Iddon, Michael I., 4,131,368, Cl. 366-81.000.
Iddon, Michael I., to Iddon Brothers Limited. Scrolls for extruding machines. 4,131,368, Cl. 366-81.000.
Ifo Sanitar AB: *See*—
Olsson, Knut A. G.; Astrom, Karl P. E.; and Johansson, Johan C., 4,131,546, Cl. 210-77.000.
Ihlein, Walter; Kleeberg, Wolfgang; Markert, Helmuth; and Mertens, Willi, to Siemens Aktiengesellschaft. Hot-hardening reaction resin mixture for impregnating the insulation of electrical equipment and for the manufacture of molded materials with or without inserts. 4,131,600, Cl. 528-53.000.
Iida, Takahumi: *See*—
Kurono, Masayasu; Toda, Masaaki; Niwa, Haruki; Kosuge, Syunji; Iida, Takahumi; and Narita, Kenichi, 4,131,747, Cl. 562-469.000.
Iijima, Masayuki: *See*—
Saito, Yuichi; Iijima, Masayuki; and Mayama, Osamu. 4,131,450, Cl. 75-0.5BA.
Iino, Yasuo: *See*—
Yoshida, Masashi; Iino, Yasuo; and Sato, Katsuya, 4,131,922, Cl. 360-90.000.
Ikeda, Michio: *See*—
Ono, Takatoshi; and Ikeda, Michio, 4,131,267, Cl. 269-21.000.
Ikezaki, Muneyoshi; Okazaki, Yashushi; Ito, Nobuo; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, to Tanabe Seiyaku Co., Ltd. Novel benzylalcohol derivatives and processes for preparing the same. 4,131,686, Cl. 424-330.000.
Ikushima, Yukio: *See*—
Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.
Ilfrey, William T.: *See*—
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Ilnitsky, Vladimir Y.: *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,131,184, Cl. 192-3.260.
Imperial Chemical Industries Limited: *See*—
Attwood, Terence E., 4,131,711, Cl. 428-332.000.
Rennison, Stuart C.; Pope, John A.; and Andrews, Timothy D., 4,131,468, Cl. 96-75.000.
Smith, Leslie H., 4,131,685, Cl. 424-322.000.
Imperial Oil Limited: *See*—
Porteous, Kenneth, 4,131,535, Cl. 208-11.0LE.
Inbar, Michael: *See*—
Bruck, Avraham; and Inbar, Michael, 4,131,800, Cl. 250-461.00B.
Incom International Inc.: *See*—
Olsen, Roger F.; and Cantley, George, 4,131,037, Cl. 74-876.000.
Industrie Pirelli S.p.A.: *See*—
Bertazzoli, Guido; Gironi, Roberto; and Resentini, Angelo, 4,131,148, Cl. 152-209.00B.
Pirovano, Dante, 4,131,402, Cl. 425-38.000.
Ingestrom, Curt Holger: *See*—
Gustavsson, Stig O. S., 4,130,973, Cl. 52-309.170.
Ingram, John D., to Schlumberger Technology Corporation. Method and apparatus for acoustic logging of a borehole. 4,131,875, Cl. 340-15.5BH.
Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, to Matsushita Electric Works, Ltd. Ultrasonic wave echo-type switch. 4,131,872, Cl. 340-1.00R.
Inoue, Kazuo: *See*—
Nishikawa, Shigeyoshi; Muroshima, Takashi; Sakaguchi, Hirokazu; Hasebe, Morihiko; Katagiri, Katsuji; and Inoue, Kazuo, 4,131,931, Cl. 361-315.000.
Inoue, Yoshihiro: *See*—
Nagasaki, Katsumi; Tanimura, Koichi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; and Momose, Tetsuo, 4,131,303, Cl. 285-302.000.
Institut de Recherches de la Siderurgie Francaise (Irsid): *See*—
Delassus, Jean, 4,131,813, Cl. 310-13.000.
Institut fur Kerntechnik und Energiewandlung e.V.: *See*—
Abhat, Ashok; and Neuer, Gunther, 4,131,158, Cl. 165-104.00S.
Institut National de la Recherche Agronomique: *See*—
Grosclaude, Gerard; Regnier, Jean; and Cavarroc, Marcel, 4,131,688, Cl. 426-40.000.
Petit, Leon; Davin, Andre; and Gueguen, Jacques, 4,131,607, Cl. 260-123.500.
Instytut Chemii Przemyslowej: *See*—
Klopotek, Alojzy; Uminski, Jerzy; and Dziala, Gabriela, 4,131,556, Cl. 252-106.000.
Instytut Ciezkiej Syntezy Organicznej "Blachownia": *See*—
Kiedik, Maciej; Grzywa, Edward; Kolt, Jozef; Terelak, Kazimierz; Czyz, Jerzy; and Niezgoda, Anna, 4,131,749, Cl. 568-781.000.
International Business Machines Corporation: *See*—
Agard, Richard L.; Bocinski, Terrence E.; Brearley, Lawrence E.; and Yaple, William R., 4,131,933, Cl. 361-415.000.
Bakos, Peter; and Rasile, John, 4,131,516, Cl. 204-15.000.
Bialko, Joseph A.; and Lechaton, John S., 4,131,533, Cl. 204-298.000.
Feng, Bai-Cwo; and Feng, George C., 4,131,497, Cl. 148-187.000.
Hatchett, Michael R.; and Rigbey, Leonard J., 4,131,199, Cl. 206-444.000.
Malaviya, Shashi D., 4,131,861, Cl. 331-2.000.
Moyer, James T., 4,131,940, Cl. 364-200.000.
Shea, Vincent; and Wojcik, Walter J., 4,131,363, Cl. 355-75.000.
International Flavors & Fragrances Inc.: *See*—
Hall, John B.; and Weigers, Wilhelmus J., 4,131,555, Cl. 252-89.00R.
Hall, John B.; and Wiegers, Wilhelmus J., 4,131,557, Cl. 252-132.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,131,687, Cl. 426-3.000.
International Harvester Company: *See*—
Fardal, Randolph G.; and Rickerd, Calvin P., 4,130,980, Cl. 56-10.200.
Kindle, John J., 4,131,293, Cl. 280-166.000.
International Paper Company: *See*—
Barry, Edward J., 4,131,228, Cl. 229-23.00R.
International Telephone and Telegraph Corporation: *See*—
Kubinsky, Eugene J., 4,131,705, Cl. 428-106.000.
International Tool Company, The: *See*—
Kohl, Harry E.; and Cotton, Gordon, 4,131,006, Cl. 72-67.000.
Introl Corp.: *See*—
Bennefeld, David H., 4,131,841, Cl. 320-23.000.
Iovine, Carmine P.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corporation. Process for the preparation of graft copolymers of a water soluble monomer and polysaccharide employing a two-phase reaction system. 4,131,576, Cl. 260-17.4GC.
Irrigation Specialties Company: *See*—
Lieding, Calvin A., 4,131,235, Cl. 239-533.150.
Isaksson, Sven-Erik, to ASEA Aktiebolag. Furnace for the high temperature-high pressure treatment of materials which includes pressure medium circulation channels. 4,131,419, Cl. 432-205.000.
Ise Kagaku Kogyo Kabushiki Kaisha: *See*—
Kato, Hiroshi, 4,131,423, Cl. 8-34.000.
Isherwood, Harold; and Shaw, John T., to British Industrial Plastics Ltd. Starch. 4,131,574, Cl. 260-17.300.
Ishibashi, Youji: *See*—
Sato, Isao; Uchiyama, Yoshihiro; Ishibashi, Youji; Tsukahara, Satoshi; Oshima, Ryoichiro; and Hishinuma, Yukio, 4,131,432, Cl. 422-177.000.
Ishii, Katsuto: *See*—
Kohga, Masayuki; and Ishii, Katsuto, 4,131,847, Cl. 324-141.000.
Ishii, Susumu; and Aoki, Tsunetaka, to Yoshida Kogyo K.K. Lock slider for slide fasteners. 4,130,918, Cl. 24-205.14A.
Ishii, Teizi: *See*—
Araki, Masakatsu; Ochi, Shuhei; Kusunoki, Toshio; Ishii, Teizi; and Sakata, Shinichi, 4,131,121, Cl. 132-7.000.
Ishikawa, Takashi: *See*—
Oishi, Akiyoshi; Harada, Tamotsu; and Ishikawa, Takashi, 4,131,490, Cl. 148-9.500.
Ishizuka, Hiroshi. Apparatus for sawing stone. 4,131,103, Cl. 125-13.00R.
Itek Corporation: *See*—
Siegel, Harvey L.; Muething, Gerald F., Jr.; and Radkowski, Edward J., 4,131,941, Cl. 364-200.000.
Ito, Kaoru: *See*—
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Ito, Nobuo: *See*—
Ikezaki, Muneyoshi; Okazaki, Yashushi; Ito, Nobuo; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,131,686, Cl. 424-330.000.
Ito, Tetsuyoshi: *See*—
Ono, Koichi; Takahara, Toshiyuki; and Ito, Tetsuyoshi, 4,131,299, Cl. 280-736.000.
Ito, Yoshinori; and Nakanishi, Mutsuo, to Sumitomo Metal Industries, Ltd. Submerged arc welding process for nickel containing steel. 4,131,781, Cl. 219-73.000.
Ivanov, Andrei B.: *See*—
Muzhzhavlev, Konstantin D.; Yazev, Vladimir D.; Schegolev, Vladimir I.; Ivanov, Andrei B.; Vasiliev, Alexei V.; Romanenko, Oleg N.; Kosarev, Sergei P.; and Ovcharenko, Vladimir G., 4,131,522, Cl. 204-60.000.
Ivanov, Ivan B., to DSO "Montaji" — Promishleno Montajno Upravlenie. Hanging prestressed roof structure. 4,130,969, Cl. 52-80.000.
Ivey, John S.; and Miller, Alan L., to Borg-Warner Corporation. Method and apparatus for transmission control system. 4,131,036, Cl. 74-866.000.
Iwahashi, Shunji; Yamasaki, Masahiro; and Fujita, Takanori, to Sumitomo Chemical Company, Limited. Methods for cleaning articles with upward flowing liquids. 4,131,483, Cl. 134-1.000.
Iwan, Wilfred D.: *See*—
Behr, Michael I.; Gyi, Ko K.; Iwan, Wilfred D.; and Palotay, Joseph C., 4,131,924, Cl. 360-106.000.
Iwata, Hiroshi; and Yamaoka, Tetsuo, to West Electric Co., Ltd. Battery checker for a camera with a flash light unit. 4,131,351, Cl. 354-60.00F.
J. I. Case Company: *See*—
Johnson, Robert G.; and Drefcinski, Earl D., 4,131,294, Cl. 280-179.00R.

J. K. and Susie L. Wadley Research Institute and Blood Bank: *See*— Dorn, Gordon L., 4,131,512, Cl. 195-103.50M.

Jack Russell Company, Inc.: *See*— Ennis, Thomas H., 4,130,962, Cl. 46-61.000.

Jackson, John L.: *See*— Archibald, John L.; and Jackson, John L., 4,131,680, Cl. 424-267.000.

Jackson Machine Products: *See*— Carter, Walter L., 4,131,266, Cl. 267-34.000.

Jacobi, Manfred: *See*— Osterloh, Rolf; Jacobi, Manfred; and Kuesters, Werner, 4,131,529, Cl. 204-159.140.

Jacobs, Barry A., to Stauffer Chemical Company. Method of evaluating scorch in flexible polyurethane foam. 4,131,660, Cl. 264-26.000.

Jacobs, James E. Removable storage compartment for auto seats. 4,131,313, Cl. 297-188.000.

Jacoby, Peter H.; and Seiz, Carl G., to Seiz Corporation. Positive-locking releasable connector for storage rack having vertically adjustable load supports. 4,131,204, Cl. 211-192.000.

Jakobi, Phil F.: *See*— Easton, Ray D.; Jakobi, Phil F.; and Zabik, Andrew L., 4,130,967, Cl. 51-5.00D.

Jamison, Will B.; and Fleck, Henry, to Consolidation Coal Company. Mining machine having advancing mine roof supports. 4,131,317, Cl. 299-31.000.

Jannsen, Klaus-Uwe: *See*— Ries, Karl; Kaiser, Dieter; and Jannsen, Klaus-Uwe, 4,131,026, Cl. 73-625.000.

Janssen, Harald: *See*— Wendt, Hartmut; Von Gruner, Horst; and Janssen, Harald, 4,131,693, Cl. 427-117.000.

Japan Bano'K Co., Ltd.: *See*— Furutu, Akira, 4,131,504, Cl. 156-384.000.

Japan Synthetic Rubber Co., Ltd.: *See*— Yoshida, Yoshinori; Kobayashi, Tutomu; Shinohara, Hironobu; and Hanari, Izumi, 4,131,743, Cl. 560-244.000.

Jarnuszkiewicz, Stanislaw. Two-stroke, multicylinder, spark ignition, pumpless injection internal combustion engine. 4,131,090, Cl. 123-32.0SP.

Jeanmart, Claude: *See*— Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Leger, Andre, 4,131,674, Cl. 424-248.540.

Jeffers, William Q.; and Ageno, Harris Y., to McDonnell Douglas Corporation. CO Chain reaction chemical laser. 4,131,863, Cl. 331-94.50G.

Jochum, Peter: *See*— Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dietrich, 4,131,729, Cl. 526-282.000.

Joglekar, Manohar A.: *See*— Freeburg, Thomas A.; Joglekar, Manohar A.; and Pajakowski, Lawrence R., 4,131,849, Cl. 325-54.000.

Johansson, Johan C.: *See*— Olsson, Knut A. G.; Astrom, Karl P. E.; and Johansson, Johan C., 4,131,546, Cl. 210-77.000.

John, Julius F., to Norco Industries, Inc. Fixed limit lifting jack. 4,131,263, Cl. 254-8.00B.

John Wyeth & Brother Ltd.: *See*— Archibald, John L.; and Jackson, John L., 4,131,680, Cl. 424-267.000.

Johndrow, John P.: *See*— Pallant, Joseph; and Johndrow, John P., 4,131,316, Cl. 297-341.000.

Johns Hopkins University, The: *See*— Hill, Maynard L.; and Whyte, Theodore R., 4,131,013, Cl. 73-181.000.

Johns-Manville Corporation: *See*— Whitaker, Thomas E.; Myles, Samuel; and Gardner, Ian P., 4,131,638, Cl. 264-333.000.

Johnson, Charles R.; Forlow, John K.; Black, Paul G.; Mitchell, William A.; and Clark, John S., to Ex-Cell-O Corporation. High speed spindle and draw bar assembly. 4,131,054, Cl. 90-11.00D.

Johnson Controls, Inc.: *See*— Matthews, Russell B., 4,131,412, Cl. 431-16.000.

Johnson Farm Machinery Co. Inc.: *See*— Husome, Robert G.; Fleming, Ron J.; and Swanson, Ron E., 4,131,540, Cl. 209-582.000.

Johnson, Ralph E., to Singer Company, The. Sewing machine work feeding mechanism. 4,131,076, Cl. 112-210.000.

Johnson, Robert G.; and Drefcinski, Earl D., to J. I. Case Company. Skidding and bunching trailer. 4,131,294, Cl. 280-179.00R.

Johnson, Roland W.: *See*— Einsel, Kenneth D.; and Johnson, Roland W., 4,130,998, Cl. 64-3.000.

Jolley, Michael E.: *See*— Reddy, Reddy R. V.; and Jolley, Michael E., 4,131,798, Cl. 250-328.000.

Jones, J. Paul, Jr. Solar energy absorber. 4,131,110, Cl. 126-271.000.

Jonnet, Albert G., to Koppers Company, Inc. Coke quenching car. 4,131,070, Cl. 105-273.000.

Jordan College: *See*— Coxon, DeWayne; and Bregg, Gary N., 4,131,109, Cl. 126-270.000.

Josam Manufacturing Co.: *See*— Flegel, George J.; Mielbeck, Roger L.; and Pizarek, Patrick J., 4,130,907, Cl. 4-300.000.

Joseph, George L., to FMC Corporation. Torsion bar and method of forming the same. 4,131,491, Cl. 148-12.00B.

Joutsjoki, Jukka, to Oy Wartsila AB. Calender. 4,131,063, Cl. 100-162.00R.

Judkins, Ren. Non-injurious amusement ball and method of making same. 4,131,276, Cl. 273-58.00C.

Jukes, John A.; and McGettigan, Philip A., to Northern Electric Company Limited. Method of powder coating an insulated electrical conductor. 4,131,690, Cl. 427-32.000.

Junge, Karl-Wilhelm: *See*— Fischer, Gunther; Wenzel, Beate; Scheithauer, Steffen; Franz, Udo; Junge, Karl-Wilhelm; Schroter, Christof; Gahler, Siegfried; and Morgenstern, Johannes, 4,131,470, Cl. 96-107.000.

Jurin, Ivan L.: *See*— Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,131,184, Cl. 192-3.260.

Just, Wilhelm, to Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V. Preparation of carrier ampholyte mixtures. 4,131,534, Cl. 204-299.00R.

Kabushiki Kaisha Kaneda Kikai Seisakusho: *See*— Kawada, Tomoshi; and Okamura, Yuichi, 4,131,206, Cl. 214-1.0BB.

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Kachik, Robert H.; and Pignocco, Arthur J., to United States Steel Corporation. Method of forming a high-temperature abrasion-resistant coating on a ferrous metal substrate, and resulting article. 4,131,473, Cl. 106-1.120.

Kaebernick, Hartmut: *See*— Bottcher, Hubert; Pfannmuller, Joachim; Kaebernick, Hartmut; Steiniger, Wolfgang; and Preuss, Horst-Dieter, 4,131,501, Cl. 156-157.000.

Kaenel, Reginald A., to AMF Incorporated. Electronic bowling scoring system with bus communication between manager console and lane score consoles. 4,131,948, Cl. 364-900.000.

Kagan, Naum Y.; Bortnik, Vladimir M.; Korenbljum, Isai V.; Razumeev, Jury A.; Lyass, Abram M.; Borsuk, Pavel A.; Usubov, Zokhrab G. O.; and Dmitrieva, Valentina A. Moulding composition for making foundry moulds and cores. 4,131,477, Cl. 106-38.350.

Kahn, Leonard R. Method and means for improving the spectrum utilization of communications channels. 4,131,765, Cl. 179-15.55R.

Kai, Toshio: *See*— Tanaka, Junzo; and Kai, Toshio, 4,131,778, Cl. 219-10.55F.

Kaiser, Dieter: *See*— Ries, Karl; Kaiser, Dieter; and Jannsen, Klaus-Uwe, 4,131,026, Cl. 73-625.000.

Kakinaka, Arao: *See*— Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.

Kako, Yuji; Kiguga, Toyoji; and Sanuki, Tetsuo, to Sumitomo Durez Company, Ltd. Method for preparing stable aqueous emulsion of phenolic resin. 4,131,582, Cl. 260-29.300.

Kamyr Inc.: *See*— Laakso, Oliver A., 4,131,508, Cl. 162-30.00K.

Kaneko, Koichi; Abe, Kiyotaka; and Miura, Masakazu, to Mitsubishi Kinzoku Kabushiki Kaisha. Apparatus for stripping electrodeposited metal from cathode sheets. 4,131,531, Cl. 204-208.000.

Karino, Yukio: *See*— Miyazako, Takushi; Sakaguchi, Shinji; Hanai, Sosuke; and Karino, Yukio, 4,131,469, Cl. 96-77.000.

Karkoski, Joseph; Payette, Lionel J.; and Shurboff, John D., to Essex International, Inc. Mixtures of linear polyesters used to coat metallic strands. 4,131,714, Cl. 428-379.000.

Karp, Stewart. Chromatography detector. 4,131,427, Cl. 23-230.00R.

Kashiwabara, Yasushige: *See*— Hara, Toshitsugu; Abe, Yoritsune; Ootuka, Katsuji; Kashiwabara, Yasushige; Oshiyama, Hiroichi; Yanadori, Michio; Kato, Eisaku; and Okazaki, Kichizaemon, 4,130,997, Cl. 62-504.000.

Kastening, Bertel: *See*— Faul, Wolfgang; and Kastening, Bertel, 4,131,523, Cl. 204-129.100.

Kastl, Hans: *See*— Muller, Otto; Gugel, Georg; and Kastl, Hans, 4,131,018, Cl. 73-432.00R.

Kasuga Denki Co., Ltd.: *See*— Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.

Katagiri, Katsuji: *See*— Nishikawa, Shigeyoshi; Muroshima, Takashi; Sakaguchi, Hirokazu; Hasebe, Morihiko; Katagiri, Katsuji; and Inoue, Kazuo, 4,131,931, Cl. 361-315.000.

Katayama, Susumu: *See*— Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, 4,131,872, Cl. 340-1.00R.

Kato, Eisaku: *See*— Hara, Toshitsugu; Abe, Yoritsune; Ootuka, Katsuji; Kashiwabara, Yasushige; Oshiyama, Hiroichi; Yanadori, Michio; Kato, Eisaku; and Okazaki, Kichizaemon, 4,130,997, Cl. 62-504.000.

Kato, Hajime: *See*— Uchikawa, Hiroshi; and Kato, Hajime, 4,131,474, Cl. 106-38.350.

Kato, Hiroshi, to Ise Kagaku Kogyo Kabushiki Kaisha. Process for dyeing cellulose fibers with vat or sulfur dyes and oxyhalogen acid. 4,131,423, Cl. 8-34.000.

Kawada, Tomoshi; and Okamura, Yuichi, to Kabushiki Kaisha Tokyo Seisakusho; and Kabushiki Kaisha Kaneda Kikai Seisakusho. Automatic apparatus for furnishing web in rotary press. 4,131,206, Cl. 214-1.0BB.

Kawamura, Takeo: *See—*
Nakamura, Yoshitsugu; Kawamura, Takeo; Saiki, Noritsugu; and Tokashiki, Michiyuki, 4,131,594, Cl. 260-40.00R.

Kawana, Hiroyoshi: *See—*
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Kawana, Hiroyoshi; Ono, Yusuke; and Matsuda, Mutsuhide, 4,131,350, Cl. 354-31.000.

Kay-Ray, Inc.: *See—*
Pakulis, Ivars E., 4,131,845, Cl. 324-58.50A.

Kazama, Kiyoshi: *See—*
Hashimoto, Satoshi; Okumura, Nobuya; and Kazama, Kiyoshi, 4,131,601, Cl. 528-279.000.

Kazin, Stephen B.; and Matta, Ram K., to General Electric Company. Curved blade turbomachinery noise reduction. 4,131,387, Cl. 415-119.000.

Keblys, Kestutis A.; and McEven, John M., to Ethyl Corporation. Iodine recovery process. 4,131,645, Cl. 423-501.000.

Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., to Motorola, Inc. Interconnection for photovoltaic device array. 4,131,755, Cl. 136-89.00P.

Keith, Marvin W., Jr., to Buehler Ltd. Mounting press. 4,131,403, Cl. 425-127.000.

Kelley, Jay R. Insulation panel. 4,130,975, Cl. 52-588.000.

Kendall Company, The: *See—*
Layton, Terry N., 4,131,016, Cl. 73-215.000.

Kendall, Giles A., Jr., to Clemar Mfg. Corp. Waterproof electrical connector. 4,131,331, Cl. 339-126.0RS.

Kennecott Copper Corporation: *See—*
Kim, Jonathan J.; Loose, Thomas A.; and Wang, Chih-Chung, 4,131,453, Cl. 75-72.000.

Kensrue, Milo M.; and Martin, Donald L. Welding apparatus. 4,131,783, Cl. 219-124.310.

Kerb, Ulrich: *See—*
Alig, Leo; Furst, Andor; Muller, Marcel; Kerb, Ulrich; and Wiechert, Rudolf, 4,131,655, Cl. 260-946.000.

Kerk Motion Products, Inc.: *See—*
Erikson, Kenneth W.; and Erikson, Keith W., 4,131,031, Cl. 74-441.000.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*
Faul, Wolfgang; and Kastening, Bertel, 4,131,523, Cl. 204-129.100.

Kesseler, Helmut; Anstadt, Gerd L.; and Kiefer, Hermann, to Gerbruder Kommerling Kunststoffwerke G.m.b.H. Frame for doors, windows and the like. 4,130,976, Cl. 52-656.000.

Keulertz, Werner; and Wessel, Karl-Heinz, to DEMAG, Aktiengesellschaft. Expandable mandrel reel. 4,131,240, Cl. 242-72.100.

Keyes, John H. Low energy consumption vehicle propelled by thermal engine. 4,131,171, Cl. 180-54.00R.

Kholdyakov, Nikolai I.: *See—*
Minachev, Khabib M.; Mortikov, Evgeny S.; Leontiev, Alexandr S.; Smirnov, Anatoly G.; Kononov, Nikolai F.; Masloboev-Shvedov, Alexei A.; Zhomov, Alexandr K.; and Kholdyakov, Nikolai I., 4,131,750, Cl. 568-901.000.

Kiedik, Maciej; Grzywa, Edward; Kolt, Jozef; Terelak, Kazimierz; Czyz, Jerzy; and Niezgoda, Anna, to Instytut Ciezkiej Syntezy Organicznej "Blachownia". Method for waste recovery from a process of the production of diphenylolpropane. 4,131,749, Cl. 568-781.000.

Kiefer, Hermann: *See—*
Kesseler, Helmut; Anstadt, Gerd L.; and Kiefer, Hermann, 4,130,976, Cl. 52-656.000.

Kiguga, Toyoji: *See—*
Kako, Yuji; Kiguga, Toyoji; and Sanuki, Tetsuo, 4,131,582, Cl. 260-29.300.

Kikumoto, Ryoji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,131,673, Cl. 424-247.000.

Kim, Jonathan J.; Loose, Thomas A.; and Wang, Chih-Chung, to Kennecott Copper Corporation. Pyrometallurgical brass production. 4,131,453, Cl. 75-72.000.

Kim, Young M. Nail clipper. 4,130,937, Cl. 30-28.000.

Kimura, Shinji; Godai, Tomokazu; Minato, Shoji; Kobayashi, Minoru; Yamaga, Makoto; Maki, Shingo; Hashimoto, Yoshizo; Suga, Tetsuo; and Saita, Hiroshi, to Kobe Steel, Ltd. Coated welding electrode containing chromium. 4,131,784, Cl. 219-137.0WM.

Kimura, Tadashi, to Olympus Optical Co., Ltd. Photographic lens system. 4,131,335, Cl. 350-218.000.

Kimura, Tadashi; and Watanabe, Fumitaka, to Olympus Optical Co., Ltd. Finder optical system for single lens reflex photographic cameras. 4,131,355, Cl. 354-225.000.

Kindle, John J., to International Harvester Company. Retractable service ladder. 4,131,293, Cl. 280-166.000.

King, Randall N.: *See—*
Breiter, Manfred W.; Chatterji, Debajyoti; King, Randall N.; and Park, Dong-Sil, 4,131,226, Cl. 228-198.000.

King, Terence P. Belt hook and method of making same. 4,130,916, Cl. 24-186.000.

Kinoshita, Hiroyuki, to Tokyo Shibaura Electric Co., Ltd. Dynamic random access memory using MOS FETs and method for manufacturing same. 4,131,906, Cl. 357-41.000.

Kirkland, Joseph J.: *See—*
Bergna, Horacio E.; and Kirkland, Joseph J., 4,131,542, Cl. 210-31.00C.

Kirkpatrick, Harold B.; Distler, Edward C.; and Menzin, Marvin, to Reichhold Chemicals, Inc. Orthopedic cast. 4,131,114, Cl. 128-90.000.

Kirschbaum, Peter: *See—*
Erb, Hans Joachim; Brandt, Jurgen; and Kirschbaum, Peter, 4,131,900, Cl. 346-162.000.

Kirschner, Nikolaus, to Siemens Aktiengesellschaft. I.I.L. with injector base resistor and schottky clamp. 4,131,806, Cl. 307-215.000.

Kitazato, Hajime: *See—*
Komori, Masakazu; Shiga, Kazuyuki; Kitazato, Hajime; Okajima, Hiroaki; Tanaka, Yoshiharu; Nojima, Shoiti; Fukamachi, Masashige; and Kurima, Akinori, 4,131,565, Cl. 252-417.000.

Kite, George F.; Gellatly, Grant; and Uhl, Richard G., to Philip Morris Incorporated. Method for removal of potassium nitrate from tobacco extracts. 4,131,117, Cl. 131-140.00C.

Klaver, Olof E. H.: *See—*
Daub, Dirk; and Klaver, Olof E. H., 4,131,908, Cl. 357-42.000.

Kleeberg, Wolfgang: *See—*
Ihlein, Walter; Kleeberg, Wolfgang; Markert, Helmuth; and Mertens, Willi, 4,131,600, Cl. 528-53.000.

Klein, Gerald I.: *See—*
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Klemm, Kurt: *See—*
Amschler, Hermann; Klemm, Kurt; and Ludwig, Gerhard, 4,131,678, Cl. 424-251.000.

Klockenga, Michael E., to PPG Industries, Inc. Method of selectively heating an edge of a glass sheet during a welding program. 4,131,445, Cl. 65-40.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Brachthauser, Kunibert, 4,130,945, Cl. 34-10.000.

Klopotek, Alojzy; Uminski, Jerzy; and Dziala, Gabriela, to Instytut Chemii Przemyslowej. Method for manufacturing bromine and bromine-iodine detergents and disinfectants. 4,131,556, Cl. 252-106.000.

Klos, Daniel J., to Conair, Inc. Transporting device and method of transporting. 4,131,319, Cl. 302-58.000.

Klosterman, David P.: *See—*
Gordy, Donald G.; and Klosterman, David P., 4,131,379, Cl. 403-197.000.

Knapik, H. Peter G.: *See—*
Adams, Frank H.; and Knapik, H. Peter G., 4,131,536, Cl. 208-139.000.

Knapp, Robert L.; Blodee, Leif; and Van Loo, William R., to American Seating Company. Seating furniture. 4,131,314, Cl. 297-248.000.

Knauer, Karl; and Pfleiderer, Hans-Joerg, to Siemens Aktiengesellschaft. Opto-electronic sensor. 4,131,810, Cl. 307-311.000.

Kobayashi, Minoru: *See—*
Kimura, Shinji; Godai, Tomokazu; Minato, Shoji; Kobayashi, Minoru; Yamaga, Makoto; Maki, Shingo; Hashimoto, Yoshizo; Suga, Tetsuo; and Saita, Hiroshi, 4,131,784, Cl. 219-137.0WM.

Kobayashi, Tutomu: *See—*
Yoshida, Yoshinori; Kobayashi, Tutomu; Shinohara, Hironobu; and Hanari, Izumi, 4,131,743, Cl. 560-244.000.

Kobe Steel, Ltd.: *See—*
Kimura, Shinji; Godai, Tomokazu; Minato, Shoji; Kobayashi, Minoru; Yamaga, Makoto; Maki, Shingo; Hashimoto, Yoshizo; Suga, Tetsuo; and Saita, Hiroshi, 4,131,784, Cl. 219-137.0WM.
Utsunomiya, Kei; Soga, Kazuya; Shimasaki, Katsunori; Mito, Yutaka; Oaki, Mamoru; Haseba, Shigeru; Miki, Hiroetu; and Masaki, Michiko, 4,131,643, Cl. 423-239.000.

Koblasz, Arthur J.: *See—*
Fender, Derek H.; and Koblasz, Arthur J., 4,131,113, Cl. 128-2.00T.

Kobori, Sigeyuki: *See—*
Amano, Matsuo; Kobori, Sigeyuki; and Sugawara, Toru, 4,131,930, Cl. 361-211.000.

Koch, Christian: *See—*
Michel, Alfred; Henkel, Hans-Joachim; Koch, Christian; and Kostka, Hana, 4,131,569, Cl. 252-462.000.

Koch, Peter, to United States of America, Agriculture. Helical flaking head with multiple cutting circle diameters. 4,131,146, Cl. 144-221.000.

Koehlinger, Allen W.; and Fox, Norman J., to R. A. Jones & Co. Inc. Twelve bottle carton. 4,131,230, Cl. 229-40.000.

Koehring Company: *See—*
Densmore, Dennis G., 4,130,940, Cl. 33-139.000.

Koenig, Edwin T.: *See—*
Mezrich, Reuben S.; and Koenig, Edwin T., 4,131,021, Cl. 73-606.000.

Koenig, Karl-Heinz; Schirmer, Ulrich; Wuerzer, Bruno; and Fett, Kurt, to BASF Aktiengesellschaft. Diurethanes. 4,131,751, Cl. 560-29.000.

Koenig, Shulamith. Selectively-controlled pulsating water shower head. 4,131,233, Cl. 239-381.000.

Koett, Albert C., to AKH Inc. Headless riveting system. 4,130,922, Cl. 29-243.530.

Koguchi, Mitsuo: *See—*
Hashimoto, Mitsuo; and Koguchi, Mitsuo, 4,131,347, Cl. 353-28.000.

Kohga, Masayuki; and Ishii, Katsuto, to Shoei Electric Co., Ltd. Device for measuring active and/or reactive component of AC current or AC power. 4,131,847, Cl. 324-141.000.

Kohl, Harry E.; and Cotton, Gordon, to International Tool Company, The. Fixed mechanical feed for a riveting device. 4,131,006, Cl. 72-67.000.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,131,915, Cl. 358-260.000.

Kolt, Jozef: *See—*
Kiedik, Maciej; Grzywa, Edward; Kolt, Jozef; Terelak, Kazimierz; Czyz, Jerzy; and Niezgoda, Anna, 4,131,749, Cl. 568-781.000.

Komori, Masakazu; Shiga, Kazuyuki; Kitazato, Hajime; Okajima, Hiroaki; Tanaka, Yoshiharu; Nojima, Shoiti; Fukamachi, Masashige; and Kurima, Akinori. Process for reactivating spent activated-carbon. 4,131,565, Cl. 252-417.000.

Komura, Yoji: *See*—
Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.

Kononov, Nikolai F.: *See*—
Minachev, Khabib M.; Mortikov, Evgeny S.; Leontiev, Alexandr S.; Smirnov, Anatoly G.; Kononov, Nikolai F.; Masloboev-Shvedov, Alexei A.; Zhomov, Alexandr K.; and Kholdyakov, Nikolai I., 4,131,750, Cl. 568-901.000.

Koob, Dieter: *See*—
Blankenmeister, Anton; Peinecke, Ludwig; and Koob, Dieter, 4,131,197, Cl. 206-387.000.

Koopmann, Adolf: *See*—
Hofmann, Wilfried; Leuder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, 4,131,348, Cl. 353-72.000.

Kopito, Louis; Schuster, Samuel R.; and Kosasky, Harold, to Ovutime, Inc. Probe for obtaining sample of cervical mucus. 4,131,112, Cl. 128-2.00B.

Koppers Company, Inc.: *See*—
Jonnet, Albert G., 4,131,070, Cl. 105-273.000.

Koppl, Franz: *See*—
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,131,659, Cl. 264-25.000.

Korenbljum, Isai V.: *See*—
Kagan, Naum Y.; Bortnik, Vladimir M.; Korenbljum, Isai V.; Razumeev, Jury A.; Lyass, Abram M.; Borsuk, Pavel A.; Usubov, Zokhrab G. O.; and Dmitrieva, Valentina A., 4,131,477, Cl. 106-38.350.

Korver, Jan A. C., to U.S. Philips Corporation. Sawtooth generator. 4,131,807, Cl. 307-228.000.

Kos, Vladimir: *See*—
Kupf, Lubomir; and Kos, Vladimir, 4,131,411, Cl. 425-559.000.

Kosarev, Sergei P.: *See*—
Muzhzhavlev, Konstantin D.; Yazev, Vladimir D.; Schegolev, Vladimir I.; Ivanov, Andrei B.; Vasiliev, Alexei V.; Romanenko, Oleg N.; Kosarev, Sergei P.; and Ovcharenko, Vladimir G., 4,131,522, Cl. 204-60.000.

Kosasky, Harold: *See*—
Kopito, Louis; Schuster, Samuel R.; and Kosasky, Harold, 4,131,112, Cl. 128-2.00B.

Kostas, James M.: *See*—
Crumrine, Albert W., Jr.; Fones, Theodore H.; Kostas, James M.; and Vanderburg, Raymond M., 4,131,156, Cl. 165-51.000.

Kostka, Hana: *See*—
Michel, Alfred; Henkel, Hans-Joachim; Koch, Christian; and Kostka, Hana, 4,131,569, Cl. 252-462.000.

Kosuge, Shuichi, to Nippondenso Co., Ltd. Indication system. 4,131,886, Cl. 340-378.00R.

Kosuge, Syunji: *See*—
Kurono, Masayasu; Toda, Masaaki; Niwa, Haruki; Kosuge, Syunji; Iida, Takahumi; and Narita, Kenichi, 4,131,747, Cl. 562-469.000.

Koyama, Masateru; and Arakawa, Kazuo, to Matsushita Electric Industrial Co., Ltd. High tension voltage source. 4,131,843, Cl. 323-9.000.

Kraftwerk Union Aktiengesellschaft: *See*—
Haidlen, Friedrich, 4,131,509, Cl. 176-38.000.
Muller, Otto; Gugel, Georg; and Kastl, Hans, 4,131,018, Cl. 73-432.00R.

Kramm, Douglass J.; Lawall, Thomas R.; and Talago, Paul, to Fuller Company. Tube coolers for rotary kilns. 4,131,418, Cl. 432-80.000.

Krauer, Otto A., to Otis Elevator Company. Speed dictation apparatus. 4,131,183, Cl. 187-29.00R.

Krauss, Clifford J., to Cominco Ltd. Method and apparatus for measuring specific gravity of liquids in process streams. 4,131,019, Cl. 73-453.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Hultsch, Gunther; and Bock, Harald, 4,130,944, Cl. 34-8.000.

Kressel, Henry: *See*—
Ladany, Ivan; and Kressel, Henry, 4,131,904, Cl. 357-17.000.

Kroebel, Reinhard: *See*—
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,131,563, Cl. 252-301.10W.

Krueger, John: *See*—
Hofmann, Wilfried; Leuder, Guenther; Rauffer, Walter; Krueger, John; and Koopmann, Adolf, 4,131,348, Cl. 353-72.000.

Krug, Hans-Dietrich, to Carl Freudenberg, Firma. Shoe insert. 4,130,948, Cl. 36-44.000.

Kub, Francis J., to Westinghouse Electric Corp. Novel bipolar transistor with a dual-dielectric tunnel emitter. 4,131,902, Cl. 357-6.000.

Kubinsky, Eugene J., to International Telephone and Telegraph Corporation. Structural laminate. 4,131,705, Cl. 428-106.000.

Kubler, John M.: *See*—
Hugli, Hans W.; and Kubler, John M., 4,131,020, Cl. 73-517.00B.

Kubota, Ltd.: *See*—
Nagasaki, Katsumi; Tanimura, Koichi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; and Momose, Tetsuo, 4,131,303, Cl. 285-302.000.

Kudelka, Herbert: *See*—
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Kuesters, Werner: *See*—
Osterloh, Rolf; Jacobi, Manfred; and Kuesters, Werner, 4,131,529, Cl. 204-159.140.

Kufrin, Fred W.; and Carpentier, John H., to Oce-Industries Inc. Record card feeding apparatus. 4,131,273, Cl. 271-4.000.

Kujawa, Anthony, Jr.; and Kujawa, Frank J., to Production Research, Inc. Ventilator hatch assembly. 4,130,966, Cl. 49-141.000.

Kujawa, Frank J.: *See*—
Kujawa, Anthony, Jr.; and Kujawa, Frank J., 4,130,966, Cl. 49-141.000.

Kukucka, William P.: *See*—
Gillett, Kenneth; Steiner, Edward L.; Fiske, Kenton W.; Davis, Kenneth A.; Kukucka, William P.; Criswell, Thomas; and Richardson, Philip, 4,131,942, Cl. 364-200.000.

Kumagai, Kiyoshi: *See*—
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Kumandan, Ramakrishnarao K., to Hughes Company, Inc. Declusterer device. 4,131,062, Cl. 99-638.000.

Kumata, Kiyoshi: *See*—
Kuzumoto, Takatoshi; Kumata, Kiyoshi; and Yamamoto, Keizo, 4,131,864, Cl. 331-116.00R.

Kuo, James R., to Fairchild Camera and Instrument Corporation. TTL to MOS driver circuit. 4,131,808, Cl. 307-270.000.

Kupf, Lubomir; and Kos, Vladimir, to Statni vyzkumny ustav materialu. Arrangement for manufacture of voluminous products made of plastics. 4,131,411, Cl. 425-559.000.

Kurichh, Sham L., to Midland-Ross Corporation. Tractor-trailer air brake system with trailer multi-functional emergency control valve fixture. 4,131,324, Cl. 303-7.000.

Kurima, Akinori: *See*—
Komori, Masakazu; Shiga, Kazuyuki; Kitazato, Hajime; Okajima, Hiroaki; Tanaka, Yoshiharu; Nojima, Shoiti; Fukamachi, Masashige; and Kurima, Akinori, 4,131,565, Cl. 252-417.000.

Kurkalov, Ivan I.: *See*—
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Kurono, Masayasu; Toda, Masaaki; Niwa, Haruki; Kosuge, Syunji; Iida, Takahumi; and Narita, Kenichi, to Ono Pharmaceutical Co., Ltd. Process for preparing α-substituted phenylalkanecarboxylic acid. 4,131,747, Cl. 562-469.000.

Kurtz, Bruce E.: *See*—
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Kurumada, Tomoyuki: *See*—
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,131,599, Cl. 260-45.80N.

Kusuki, Yoshihiro: *See*—
Nagasaka, Akira; Ashitaka, Hidetomo; Kusuki, Yoshihiro; Oda, Denichi; and Yoshinaga, Toshimune, 4,131,644, Cl. 423-447.500.

Kusunoki, Toshio: *See*—
Araki, Masakatsu; Ochi, Shuhei; Kusunoki, Toshio; Ishii, Teizi; and Sakata, Shinichi, 4,131,121, Cl. 132-7.000.

Kuwertz, Erich, to psb-Pfalzstahlbau GmbH. Catch arrangement for towing circulating conveyor with side circuit. 4,131,068, Cl. 104-172.00S.

Kuzumoto, Takatoshi; Kumata, Kiyoshi; and Yamamoto, Keizo, to Sharp Kabushiki Kaisha. Low voltage compensator for power supply in a complementary MOS transistor crystal oscillator circuit. 4,131,864, Cl. 331-116.00R.

Kvarnegard, Sven B., to AB Carl Lamm. Apparatus for thermographic duplication of information. 4,131,796, Cl. 250-319.000.

Kvita, Vratislav; Darms, Roland; and Greber, Gerd, to Ciba-Geigy Corporation. Isoimidyl-phthalic anhydrides. 4,131,613, Cl. 260-343.30R.

L M Ericsson Pty. Ltd.: *See*—
Herschtal, Ludwik, 4,131,763, Cl. 179-15.0BS.

L. R. Nelson Corporation: *See*—
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Laakso, Oliver A., to Kamyr Inc. Recovery system for oxygen bleaching of pulp. 4,131,508, Cl. 162-30.00K.

Lachowicz, Donald R.; and Holder, Charles B., to Texaco Inc. Reinforced plastic compositions containing graft copolymers. 4,131,577, Cl. 260-17.4CL.

Lacquement, Ralph G., to Phillips Petroleum Company. Recovery of dry steam from geothermal brine. 4,131,161, Cl. 166-265.000.

Ladany, Ivan; and Kressel, Henry, to RCA Corporation. Degradation resistance of semiconductor electroluminescent devices. 4,131,904, Cl. 357-17.000.

Lai, Kwo-Hrong; and Silvers, Harold N., to Beatrice Foods Company. Process for preparing polycarbonates. 4,131,731, Cl. 528-370.000.

Laing, Nikolaus. Rotary heat exchangers. 4,131,157, Cl. 165-86.000.

Laitram Corporation, The: *See*—
Lapeyre, James M., 4,130,942, Cl. 33-312.000.

Lakernik, Mark M.; Shabalina, Roza I.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Golovachev, Anatoly I.; and Egorova, Tatyana S. Method for removing zinc from zinc-containing slags. 4,131,451, Cl. 75-14.000.

Laliberte, Real: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippman, Wilbur; and Pugsley, Thomas A., 4,131,745, Cl. 560-252.000.

Lambert Corporation: *See*—
Yeager, Robert R., 4,131,221, Cl. 222-624.000.

Lambert, John W., Jr., to Tuscarora Cotton Mill. Method and apparatus for making novelty yarn. 4,130,984, Cl. 57-12.000.

Lammiman, Steven A.: *See—*
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Landsman, Robert M., to LogEtronics, Inc. Pneumatically actuated image scanning reader/writer. 4,131,916, Cl. 358-285.000.
Landstingens Inkopscentral, L I C: *See—*
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Lang, Stanley A., Jr.; Fabio, Paul F.; Lin, Yang-I; Murdock, Keith C; and Fields, Thomas L., to American Cyanamid Company. 2,6-Bis(1-morpholinoalkylideneamino)anthraquinones as anti-amebic agents. 4,131,676, Cl. 424-248.560.
Lang, Winfried: *See—*
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,131,659, Cl. 264-25.000.
Lange, Heinrich, to Siemens Aktiengesellschaft. Microprogrammable control unit. 4,131,835, Cl. 318-562.000.
Lange, Louis G., III; and Vallee, Bert L., to President and Fellows of Harvard College. Method of purifying alcohol dehydrogenase and affinity resin therefor. 4,131,727, Cl. 526-23.000.
Lantos, Ivan: *See—*
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Lanza, Thomas J.: *See—*
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,131,677, Cl. 424-256.000.
Lapeyre, James M., to Laitram Corporation, The. Borehole surveying apparatus. 4,130,942, Cl. 33-312.000.
Laporte Industries Limited: *See—*
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Larrabee, Robert D., to RCA Corporation. Power transfer apparatus. 4,131,827, Cl. 318-46.000.
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Lasag AG: *See—*
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Lather, Dieter: *See—*
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Latti, Surinder S.: *See—*
Lawrence, Noel L. W.; and Latti, Surinder S., 4,131,370, Cl. 366-273.000.
Laundy, James R., to Tenneco, Inc. Coupling device for connecting a plurality of ports to one pipe-method of making same. 4,131,007, Cl. 72-348.000.
Lavigne, Vernon W.: *See—*
Bailey, James R.; and Lavigne, Vernon W., 4,131,777, Cl. 200-311.000.
Lawall, Thomas R.: *See—*
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Lawrence, Noel L. W.; and Latti, Surinder S., to Temtron Electronics Ltd. Micro stirrer. 4,131,370, Cl. 366-273.000.
Layton, Terry N., to Kendall Company, The. Peak flow measuring device. 4,131,016, Cl. 73-215.000.
Lazarus, Sonja E.: *See—*
Boyer, Robin L.; Lazarus, Sonja E.; and Buck, F. O., Jr., 4,131,282, Cl. 273-271.000.
Lechaton, John S.: *See—*
Bialko, Joseph A.; and Lechaton, John S., 4,131,533, Cl. 204-298.000.
Lee, Gim F., Jr.: *See—*
Abolins, Visvaldis; and Lee, Gim F., Jr., 4,131,598, Cl. 260-42.180.
Lee, Maw H.; and Prehodka, Barry V., to Clopay Corporation. Position control and obstruction detector apparatus for a motor-driven door operator. 4,131,830, Cl. 318-266.000.
Lee, Tzuo-Chang; and Lin, Jacob W., to Honeywell Inc. Element for thermoplastic recording. 4,131,462, Cl. 96-1.50R.
Leger, Andre: *See—*
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Lego, Louis J., Jr., to General Electric Company. Search and locate system. 4,131,791, Cl. 250-199.000.
Leonard, Byron H., Jr., to Bechtel International Corporation. Clamp-welded pipe joint. 4,131,302, Cl. 285-114.000.
Leontiev, Alexandr S.: *See—*
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Lerner, Howard: *See—*
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Lesk, Israel A.; and Pryor, Robert A., to Motorola, Inc. Method of semiconductor solar energy device fabrication. 4,131,488, Cl. 148-1.500.
Lesk, Israel A.: *See—*
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Leuder, Guenther: *See—*
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Lewicki, Walter J., Jr., to Armstrong Cork Company. Multilevel embossing of sheet materials. 4,131,663, Cl. 264-40.200.
Lewis, Donald J.: *See—*
Radke, Donald G.; and Lewis, Donald J., 4,131,300, Cl. 280-737.000.
Libbey-Owens-Ford Company: *See—*
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Light, Bette M.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,131,687, Cl. 426-3.000.
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Lin, Jacob W.: *See—*
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Lin, Yang-I: *See—*
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Lindberg, John E., to Owen, Wickersham & Erickson. Fluid flow regulator. 4,131,134, Cl. 137-808.000.
Ling, Wilfred C., to Abbott Laboratories. Method and device for determining the end point for drying. 4,131,011, Cl. 73-29.000.
Lingl Corporation: *See—*
Lingl, Hans, Jr.; and Denison, Don E., 4,131,072, Cl. 110-106.000.
Lingl, Hans, Jr.; and Denison, Don E., to Lingl Corporation. Apparatus for individual controlled distribution of powdered solid fuel to plural burning units. 4,131,072, Cl. 110-106.000.
Lippman, Wilbur: *See—*
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Lloyd, Gareth A.; and Sasson, Steven J., to Eastman Kodak Company. Electronic still camera. 4,131,919, Cl. 360-9.000.
Lloyd, Robert G.; Street, Anthony C.; and Golden, Donald M. G. R., deceased (by Golden, Jean J., executrix), to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Aerial delivery wedge. 4,131,251, Cl. 244-137.00R.
Lockhart, Ann H.: *See—*
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Logan, David J.: *See—*
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Logic Devices, Inc.: *See—*
Allen, Paul E., 4,131,596, Cl. 264-40.500.
Long, Wesley A., to Beckmann, Karen L. Heat exchanger. 4,131,159, Cl. 165-166.000.
Loose, Thomas A.: *See—*
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Lopata, Ira. Leader pin. 4,131,305, Cl. 242-74.000.
Loring, Robert M.: *See—*
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Loughran, Gerard A.: *See—*
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Lovell, John A.; Hillegass, Donald V.; and Harris, Philip G., to Goodyear Tire & Rubber Company, The. Preparation of polyurethane composite mold by injection molding. 4,131,667, Cl. 264-571.000.
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Lubrizol Corporation, The: *See—*
Steckel, Thomas F., 4,131,554, Cl. 252-33.600.
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Lucas Electrical Company Limited, The: *See—*
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Lucas Industries Limited: *See—*
Orford, Raymond L., 4,131,460, Cl. 75-204.000.
Lucy, Carl F., to Teledyne Industries, Inc. Metallic sponge incendiary compositions. 4,131,498, Cl. 149-2.000.
Ludemann, Heinz; Fengler, Harald; and Schaner, Ferdinand, to AG-FA-Gevaert AG. Collector forming an accumulating stack from successively received severed sections of photographic strip. 4,131,041, Cl. 83-94.000.
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Lundstrom, Jan-Erik, to ASEA Aktiebolag. Character generator. 4,131,883, Cl. 340-324.0AD.
Lustig, Stanley; and Vasudevan, Ganapathy, to Union Carbide Corporation. Composite tubular casing for processed foods and method of fabricating the casing. 4,131,137, Cl. 138-118.100.
Lutz, Charles W.; and Cohen, Leon E., to FMC Corporation. Stabilized particulate peroxygen compounds. 4,131,562, Cl. 252-186.000.
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Mabe, William J., Jr., to Sundstrand Corporation. Sealing system for centrifugal pump. 4,131,386, Cl. 415-98.000.
Macari, Leonard J.: *See—*
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MacDonald, James L., Jr.; and Mink, Richard A., to Align-Rite Corporation. Method for increasing the yield of batch processed microcircuit semiconductor devices. 4,131,472, Cl. 96-38.300.
MacFarlane, Robert, Jr., to Allied Chemical Corporation. Mineral-filled nylon molding compositions exhibiting low creep. 4,131,591, Cl. 260-37.00N.
MacGillavry, Donald H.: *See—*
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Machida, Tetsuo, to Sony Corporation. Tape cassette. 4,131,243, Cl. 242-199.000.
Mackenroth, Joseph R., III; and Bode, Hugo B. Cooling hatband. 4,130,902, Cl. 2-7.000.
Madill, Kenneth D., to Algoma Steel Corporation, Limited, The. Removal and/or installation of top section of steelmaking vessel. 4,130,924, Cl. 29-401.00F.
Mador, Irving L.: *See—*
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Maeda, Yoichi, to Trio Kabushiki Kaisha. Speaker system. 4,131,180, Cl. 181-163.000.
Mager, George E.; Nelson, Frank M.; and Hall, Warren L., to Xerox Corporation. System bus module for a controller. 4,131,944, Cl. 364-200.000.
Magnussen, Haakon T., Jr., to Altex Scientific, Inc. Fluid pump mechanism. 4,131,393, Cl. 417-22.000.
Maham, Robert M.; and Beasley, Matthew D., to Texaco Inc. Apparatus for detecting presence of oil in a body of water. 4,131,773, Cl. 200-61.050.
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Makowski, Henry S.; and O'Farrell, Charles P., to Exxon Research & Engineering Co. Polymeric hydroxyalkyl sulfonates. 4,131,586, Cl. 260-31.20R.
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Malatto, Renzo, to Selecontrol S.A.S. Device for measuring the bending angles in plate-bending machines. 4,131,008, Cl. 72-389.000.
Malaviya, Shashi D., to International Business Machines Corporation. Variable frequency oscillator system including two matched oscillators controlled by a phase locked loop. 4,131,861, Cl. 331-2.000.
Malecki, Alexander J., to General Home Products Corporation. Clothes-drying rack. 4,131,205, Cl. 211-200.000.
Maller, Karen. Ski equipment carrier. 4,131,289, Cl. 280-11.37K.
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Manning, Donald L. Vehicle entrance ramp. 4,131,209, Cl. 214-85.000.
Mansfield, Wilfred P., to National Research Development Corporation. Internal combustion engines. 4,131,093, Cl. 123-41.850.
Mar, Henry Y. B.; and Zimmer, Paul B., to United States of America, Air Force. Low infrared emissivity paints comprising an oxime cured silicone binder. 4,131,593, Cl. 260-37.0SB.
Marcantonio, Arnold F., to Ball Corporation. High temperature release and lubricating compositions for glass molds. 4,131,552, Cl. 252-29.000.
Marco, Francis W., to Milliken Research Corporation. Polyester textile materials having improved durable soil release characteristics and process for producing same. 4,131,550, Cl. 252-8.600.
Marcus, Daniel M.: *See—*
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Marquis, Edgar E.; and Discepolo, Joseph, to Robertshaw Controls Company. Timer construction and clutch construction therefor or the like. 4,131,186, Cl. 192-67.00R.
Marra, Anthony W.: *See—*
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Marshall, Esther L.; and Allen, William B. Portable picnic and camping cabinet table. 4,131,327, Cl. 312-241.000.
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Martin, Donald L.: *See—*
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Martin, Jon W., to TRW Inc. Perfluoroelastomers from hydrofluoroelastomers. 4,131,726, Cl. 526-18.000.
Martin Marietta Corporation: *See—*
Underwood, William C., 4,131,254, Cl. 244-3.160.
Martinsen, Keith W. Compact camping rig. 4,131,310, Cl. 296-23.00R.
Martinsons, Aleksandrs; and Crenshaw, Marilyn, to PPG Industries, Inc. Cathode electrocatalyst. 4,131,519, Cl. 204-38.00B.
Martiny, Wolfgang; and MacGillavry, Donald H., to BASF Aktiengesellschaft. Radio-signal receiver with plug-in modules. 4,131,851, Cl. 325-355.000.
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Minachev, Khabib M.; Mortikov, Evgeny S.; Leontiev, Alexandr S.; Smirnov, Anatoly G.; Kononov, Nikolai F.; Masloboev-Shvedov, Alexei A.; Zhomov, Alexandr K.; and Kholdyakov, Nikolai I., 4,131,750, Cl. 568-901.000.
Masoero, Marcella: *See—*
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Mather, James T., to Rio Algom Limited. Sulfuric acid extraction of uranium from its ores. 4,131,639, Cl. 423-20.000.
Matner, Martin: *See—*
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Matsuda, Mutsuhide: *See—*
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Matsuda, Takashi; Niwa, Kazuo; and Sumitomo, Yasusuke, to Tokyo Shibaura Electric Co., Ltd. Semiconductor integrated circuit isolated through dielectric material and a method for manufacturing the same. 4,131,909, Cl. 357-49.000.
Matsumoto, Yasuhiro; and Eguchi, Hisanori, to Dainippon Ink & Chemicals Inc. Cross-linkable vinyl chloride resin composition. 4,131,636, Cl. 260-875.000.
Matsunaga, Koichi: *See—*
Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.
Matsushita Electric Industrial Co., Ltd.: *See—*
Koyama, Masateru; and Arakawa, Kazuo, 4,131,843, Cl. 323-9.000.
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Tanaka, Junzo; and Kai, Toshio, 4,131,778, Cl. 219-10.55F.
Matsushita Electric Works, Ltd.: *See—*
Araki, Masakatsu; Ochi, Shuhei; Kusunoki, Toshio; Ishii, Teizi; and Sakata, Shinichi, 4,131,121, Cl. 132-7.000.
Inoue, Hiromitsu; Katayama, Susumu; and Ohashi, Hiroshi, 4,131,872, Cl. 340-1.00R.
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Hirata, Masakuni; and Matsuzaki, Yukio, 4,131,658, Cl. 261-142.000.
Matta, Ram K.: *See—*
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Matthews, Russell B., to Johnson Controls, Inc. Fuel ignition system

having interlock protection and electronic valve leak detection. 4,131,412, Cl. 431-16.000.

Mattsson, Lennart P. J., to U.S. Philips Corporation. Ditherable and tunable magnetron comprising axially tuning and rotational tuning members. 4,131,825, Cl. 315-39.610.

Max-Planck-Gesellschaft zur Foederung der Wissenschaften e.V.: *See—*
Just, Wilhelm, 4,131,534, Cl. 204-299.00R.

Mayama, Osamu: *See—*
Saito, Yuichi; Iijima, Masayuki; and Mayama, Osamu, 4,131,450, Cl. 75-0.5BA.

Mayo, George L., to Speed-Saw, Inc. Apparatus for cutting floor truss web components. 4,131,143, Cl. 144-30.000.

McAuliffe, Gerald N.; and Wooters, Eldon W., to Outboard Marine Corporation. Arrangement for tapping battery bank alternately from opposite ends. 4,131,833, Cl. 318-440.000.

McAuliffe, Gerald N.: *See—*
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McBride, Thomas R.: *See—*
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McCarty, Leslie P., to Dow Chemical Company, The. Deuterated methylene chloride used as a solvent to reduce toxicity. 4,131,647, Cl. 424-10.000.

McCray, Walter A. Slag pots. 4,131,265, Cl. 266-275.000.

McCurrich, Lawrence H.; and Lammiman, Steven A., to Fosroc Holdings (U.K.) Limited. Pumpable cementitious compositions. 4,131,480, Cl. 106-93.000.

McDonald, Bertrand N., to Babcock & Wilcox Company, The. Vapor generating unit blowdown arrangement. 4,131,085, Cl. 122-382.000.

McDonnell Douglas Corporation: *See—*
Jeffers, William Q.; and Ageno, Harris Y., 4,131,863, Cl. 331-94.50G.

McEven, John M.: *See—*
Keblys, Kestutis A.; and McEven, John M., 4,131,645, Cl. 423-501.000.

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McLeod, Paul S.: *See—*
Tsujimoto, Kazumi N.; and McLeod, Paul S., 4,131,753, Cl. 13-31.0EB.

McMillan, Joseph A. Ski propulsion pack. 4,131,290, Cl. 280-11.37R.

Mead Corporation, The: *See—*
Gamblin, Rodger L., 4,131,898, Cl. 346-75.000.

Mecklenbrauker, Wolfgang F. G.: *See—*
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Mecklenburg, Gunter: *See—*
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Medical Laboratory Automation, Inc.: *See—*
Cohen, Jules B., 4,130,978, Cl. 53-444.000.

Meier, Harry F., to Alaskaug, Inc. Strand dispensing device. 4,131,241, Cl. 242-156.200.

Meinel, Aden B.; and Meinel, Walter B., to Motorola, Inc. Solar energy collector and concentrator. 4,131,485, Cl. 136-89.0PC.

Meinel, Walter B.: *See—*
Meinel, Aden B.; and Meinel, Walter B., 4,131,485, Cl. 136-89.0PC.

Meisel, Thomas C., Jr., to Caterpillar Tractor Co. Continuous belt aggregate separator. 4,131,201, Cl. 209-661.000.

Melcher, Ronald E.; and Schaefer, Frederick W., to Whitehead Brothers Company. Additive for green molding sand. 4,131,476, Cl. 106-38.350.

Menia, Manfred, to Faigle, Heinz. Rail switch arrangement. 4,131,255, Cl. 246-430.000.

Menth, Anton; Nagel, Hartmut; and Spinner, Ulrich, to BBC Brown, Boveri & Company, Limited. Permanent-magnet alloy. 4,131,495, Cl. 148-31.570.

Menzin, Marvin: *See—*
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Mercandino, Eduardo C. C. Artificial malleus columella for the human ear. 4,130,905, Cl. 3-1.900.

Merck & Co., Inc.: *See—*
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,131,677, Cl. 424-256.000.
Weinstock, Leonard M.; Wildman, Arthur S.; and Mulvey, Dennis M., 4,131,618, Cl. 562-469.000.

Merrick, James W., to Autotronic Controls, Corp. Multiple spark discharge circuitry. 4,131,100, Cl. 123-148.00E.

Mertens, Willi: *See—*
Ihlein, Walter; Kleeberg, Wolfgang; Markert, Helmuth; and Mertens, Willi, 4,131,600, Cl. 528-53.000.

Meyer, Alfred: *See—*
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,131,563, Cl. 252-301.10W.

Meyer, Jeffry R.; and Hess, Robert L., to Westinghouse Electric Corp. Compressed-gas circuit-interrupters of the puffer-type having improved supporting, shielding and assembly features. 4,131,775, Cl. 200-148.00R.

Meyer, Thomas N.: *See—*
Crookston, Ronald W.; and Meyer, Thomas N., 4,131,774, Cl. 200-82.00B.

Meyers, Albert I., to Board of Supervisors of Louisiana State University and Agricultural & Mechanical College. Synthesis of aldehydes and products of such synthesis. 4,131,623, Cl. 260-601.00R.

Mezrich, Reuben S.; and Koenig, Edwin T., to RCA Corporation. High resolution pulse-echo ultrasonic-imaging display system. 4,131,021, Cl. 73-606.000.

Mezrich, Reuben S., to RCA Corporation. Pulse-echo ultrasonic-imaging display system. 4,131,022, Cl. 73-606.000.

Mezrich, Reuben S.; and Anderson, Charles H., to RCA Corporation. Pulse-echo ultrasonic-imaging display system. 4,131,023, Cl. 73-606.000.

Mezrich, Reuben S.; and Vilkomerson, David H. R., to RCA Corporation. Pulse-echo ultrasonic-imaging display system. 4,131,024, Cl. 73-606.000.

Mezrich, Reuben S.; and Avins, Jeremiah Y., to RCA Corporation. Pulse-echo ultrasonic-imaging display system. 4,131,025, Cl. 73-606.000.

Michel, Alfred; Henkel, Hans-Joachim; Koch, Christian; and Kostka, Hana, to Siemens Aktiengesellschaft. Oxidic catalyst for the conversion of water gas. 4,131,569, Cl. 252-462.000.

Michel, Edmond: *See—*
Bodson, Luc; Obsomer, Marc; and Michel, Edmond, 4,131,665, Cl. 264-572.000.

Michel, Karl H.; and Miller, Robert F., to Eli Lilly and Company. Refillable column for chromatography at elevated pressure. 4,131,547, Cl. 210-198.00C.

Midland-Ross Corporation: *See—*
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Mielbeck, Roger L.: *See—*
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Mignien, Georges: *See—*
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Milberger, Walter E.; and Rowe, Frederick J., to Westinghouse Electric Corp. Digital chopper regulator. 4,131,938, Cl. 363-101.000.

Milgram, Jerome H.; Bartoo, Vance S.; and O'Connor, Burdett H., to Offshore Devices Inc. Pumps. 4,131,397, Cl. 417-404.000.

Miller, Alan L.: *See—*
Ivey, John S.; and Miller, Alan L., 4,131,036, Cl. 74-866.000.

Miller, Alfred H., to Libbey-Owens-Ford Company. Drive connection for conveyor roll. 4,131,420, Cl. 432-246.000.

Miller, Charles G.: *See—*
United States of America, National Aeronautics and Space Administration; Miller, Charles G.; and Stephens, James B., 4,131,336, Cl. 350-292.000.

Miller, Coleman J., to Westinghouse Electric Corp. Dipole phased array with capacitance plate elements to compensate for impedance variations over the scan angle. 4,131,896, Cl. 343-815.000.

Miller, Lester I.: *See—*
Crawley, Keenan L.; and Miller, Lester I., 4,131,571, Cl. 260-17.00R.

Miller, Ralph; and Gregg, Harry D., Jr., to Ciba-Geigy Corporation. Treatment of the waste from the production of tertiary butyl amine to recover sodium sulfate and methyl or sodium formate. 4,131,642, Cl. 423-193.000.

Miller, Robert F.: *See—*
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Cocoros, George; Chambers, Thomas V.; and Hirshfeld, Julian J., 4,131,424, Cl. 8-172.00R.
Marco, Francis W., 4,131,550, Cl. 252-8.600.
Thomas, Manuel A.; and Cogan, Jerry A., Jr., 4,131,422, Cl. 8-31.000.

Minachev, Khabib M.; Mortikov, Evgeny S.; Leontiev, Alexandr S.; Smirnov, Anatoly G.; Kononov, Nikolai F.; Masloboev-Shvedov, Alexei A.; Zhomov, Alexandr K.; and Kholdyakov, Nikolai I. Process for the production of fatty alcohols. 4,131,750, Cl. 568-901.000.

Minamida, Katsuhiro: *See—*
Sasaki, Minoru; Ito, Kaoru; Minamida, Katsuhiro; and Fujita, Keiki, 4,131,668, Cl. 264-40.400.

Minar, Frank M.; and Abitante, Peter A., to Perkin-Elmer Corporation, The. Electrical connector for sequential connection and disconnection of circuits. 4,131,328, Cl. 339-14.00R.

Minato, Shoji: *See—*
Kimura, Shinji; Godai, Tomokazu; Minato, Shoji; Kobayashi, Minoru; Yamaga, Makoto; Maki, Shingo; Hashimoto, Yoshizo; Suga, Tetsuo; and Saita, Hiroshi, 4,131,784, Cl. 219-137.0WM.

Mink, Richard A.: *See—*
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Mitchell, Stephen W. Valve timing mechanisms. 4,131,096, Cl. 123-90.150.

Mitchell, William A.: *See—*
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Mito, Yutaka: *See*—
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Mitra, Panchanan, to Ciba-Geigy Corporation. Method of laminating adhesive to a plurality of spaced fiber strips. 4,131,502, Cl. 156-179.000.
Mitsubishi Chemical Industries, Limited: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,131,673, Cl. 424-247.000.
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Saito, Yuichi; Iijima, Masayuki; and Mayama, Osamu, 4,131,450, Cl. 75-0.5BA.
Mitsui Miike Seisakusho Engineering Company Limited: *See*—
Hashimoto, Mitsuo; and Koguchi, Mitsuo, 4,131,347, Cl. 353-28.000.
Mitsuo, Takahashi; and Yoshio, Kawasumi, to Nippon Mining Co., Ltd. Surface treating process for copper foil for use in printed circuit. 4,131,517, Cl. 204-27.000.
Mitter, Mathias. Pattern printing apparatus. 4,131,000, Cl. 68-200.000.
Miura, Masakazu: *See*—
Kaneko, Koichi; Abe, Kiyotaka; and Miura, Masakazu, 4,131,531, Cl. 204-208.000.
Miyata, Takeshi: *See*—
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Miyazako, Takushi; Sakaguchi, Shinji; Hanai, Sosuke; and Karino, Yukio, to Fuji Photo Film Co., Ltd. Photographic element with polymeric ammonium mordant. 4,131,469, Cl. 96-77.000.
Mizuno, Kiyohumi; Maeda, Hiroaki; Takahashi, Shigeo; and Watanabe, Tsukasa, to Aisin Seiki Kabushiki Kaisha. Hydromechanical transmission. 4,131,035, Cl. 74-866.000.
Mizutani, Toshiaki: *See*—
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Mobay Chemical Corporation: *See*—
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Mobil Oil Corporation: *See*—
Audeh, Costandi A., 4,131,610, Cl. 260-326.00N.
Moeglich, Karl, to Westinghouse Electric Corp. Process and apparatus for removal of contaminants from water. 4,131,526, Cl. 204-149.000.
Momose, Kenichiro; and Kumagai, Kiyoshi, to Tokyo Shibaura Electric Co., Ltd. Corrosion resistant magnetic alloy. 4,131,494, Cl. 148-31.570.
Momose, Tetsuo: *See*—
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Moncrieff-Yeates, Alexander J. Heating unit with vortical aerothermodynamic flow control. 4,131,105, Cl. 126-121.000.
Monsanto Company: *See*—
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Franz, John E., 4,131,448, Cl. 71-86.000.
Montedison S.p.A.: *See*—
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Mookherjee, Braja D.: *See*—
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Moore, Richard L. Apparatus for producing structural panels. 4,131,405, Cl. 425-143.000.
Moores, Peter R.; and Shoffner, James E., to Fiber Materials, Inc. Selectively modified carbon-carbon composites. 4,131,708, Cl. 428-257.000.
Morales, Adolfo J. Evaporator. 4,131,507, Cl. 159-23.000.
Morales, Vincent M.: *See*—
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Moran, Richard J., to McGraw-Edison Company. Bridge circuits for sensing currents in a three-phase A.C. circuit. 4,131,929, Cl. 361-93.000.
Moraw, Roland; and Schadlich, Gunther, to Hoechst Aktiengesellschaft. Comparison reader for holographic identification cards. 4,131,337, Cl. 350-3.860.
Mordarski, Walter J.; and Roth, Jerome, to Combustion Engineering, Inc. Nuclear fuel element. 4,131,511, Cl. 176-68.000.
Moreno, Jose A. Paper guide device for copying machines. 4,131,364, Cl. 355-106.000.
Morgenstern, Johannes: *See*—
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Morimoto, Toshio, to Matsushita Electric Industrial Co., Ltd. Magnetic tape and recording method therefor. 4,131,926, Cl. 360-134.000.
Morley, John R.; and Howe, Ralph E., to Surface Activation Corporation. Coating a substrate by glow discharge graft polymerization. 4,131,691, Cl. 427-41.000.
Morokuma, Tadashi; and Oinoue, Kenichi, to Olympus Optical Co., Ltd. Illumination device. 4,131,361, Cl. 355-70.000.
Morris, Don L., to Eastman Kodak Company. Catalytic rearrangement of cyclic acetals to carboxylic esters. 4,131,739, Cl. 560-179.000.
Morris, Earl F.: *See*—
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Morrow, James G., Sr., to Manitowoc Company, Inc., The. Collapsible crane backhitch and overload signal system. 4,131,078, Cl. 116-4.000.
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Mortikov, Evgeny S.: *See*—
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Motorola, Inc.: *See*—
Davis, Earl K.; and Hansen, Kent W., 4,131,478, Cl. 106-53.000.
Davis, William F.; and Stein, Marc T., 4,131,928, Cl. 361-56.000.
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Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., 4,131,755, Cl. 136-89.00P.
Lesk, Israel A.; and Pryor, Robert A., 4,131,488, Cl. 148-1.500.
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Moyer, James T., to International Business Machines Corporation. Channel data buffer apparatus for a digital data processing system. 4,131,940, Cl. 364-200.000.
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Muething, Gerald F., Jr.: *See*—
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Muller, Otto; Gugel, Georg; and Kastl, Hans, to Kraftwerk Union Aktiengesellschaft. Elbow or bent tube manipulator, especially for ultrasonic testing in nuclear reactor installation. 4,131,018, Cl. 73-432.00R.
Mulvey, Dennis M.: *See*—
Weinstock, Leonard M.; Wildman, Arthur S.; and Mulvey, Dennis M., 4,131,618, Cl. 562-469.000.
Mummenthey, Hans-Dieter; and Fischer, Hannes, to Hoechst Aktiengesellschaft. Low-viscosity air-drying alkyd resins. 4,131,579, Cl. 260-22.0EP.
Munson, Robert E.; Sanford, Gary G.; and Murphy, Lawrence R., to Ball Corporation. Stacked antenna structure for radiation of orthogonally polarized signals. 4,131,892, Cl. 343-700.0MS.
Munson, Robert E.; and Sanford, Gary G., to Ball Corporation. Microstrip radiator with folded resonant cavity. 4,131,893, Cl. 343-700.0MS.
Murdock, Keith C: *See*—
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Murty, Hari N., to Carborundum Company, The. Granular activated carbon manufacture from low rank agglomerating but not good coking bituminous coal treated with dilute inorganic acid. 4,131,566, Cl. 252-423.000.
Musschoot, Albert, to General Kinematics Corporation. Vibratory apparatus. 4,131,193, Cl. 198-533.000.
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., to International Flavors & Fragrances Inc. Flavoring with terpenyl ethers. 4,131,687, Cl. 426-3.000.
Muukka, Esko. Apparatus for locating and moving heavy units. 4,130,923, Cl. 29-281.500.
Muzhzhavlev, Konstantin D.; Yazev, Vladimir D.; Schegolev, Vladimir I.; Ivanov, Andrei B.; Vasiliev, Alexei V.; Romanenko, Oleg N.; Kosarev, Sergei P.; and Ovcharenko, Vladimir G. Process for electrolytically producing magnesium and chlorine from fused salt bath. 4,131,522, Cl. 204-60.000.
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Nagasaka, Akira; Ashitaka, Hidetomo; Kusuki, Yoshihiro; Oda, Denichi; and Yoshinaga, Toshimune, to Ube Industries, Inc. Process for producing carbon fiber. 4,131,644, Cl. 423-447.500.

Nagasaki, Katsumi; Tanimura, Koichi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; and Momose, Tetsuo, to Kubota, Ltd. Telescopic assembly for pipes for conveying fluidized materials. 4,131,303, Cl. 285-302.000.

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Menth, Anton; Nagel, Hartmut; and Spinner, Ulrich, 4,131,495, Cl. 148-31.570.

Nagumo, Fumio: *See*—
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Najibi, Nassir. Spark plug power enhancer. 4,131,817, Cl. 313-124.000.

Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, to Kokusai Denshin Denwa Kabushiki Kaisha. Facsimile signal transmission system. 4,131,915, Cl. 358-260.000.

Nakai, Kaichiro; and Saito, Hisao, to Tokyo Shibaura Electric Co., Ltd. Filter device for high frequency generating device. 4,131,824, Cl. 315-39.510.

Nakajima, Hiromichi: *See*—
Ikezaki, Muneyoshi; Okazaki, Yashushi; Ito, Nobuo; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,131,686, Cl. 424-330.000.

Nakajima, Masato: *See*—
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Nakamura, Akihisa: *See*—
Sato, Yasuhito; Tanaka, Minoru; and Nakamura, Akihisa, 4,131,092, Cl. 123-32.0ST.

Nakamura, Yoshitsugu; Kawamura, Takeo; Saiki, Noritsugu; and Tokashiki, Michiyuki, to Teijin Limited. Fire-resistant thermoplastic polyester resin compositions and process for rendering polyesters fire-resistant. 4,131,594, Cl. 260-40.00R.

Nakanishi, Mutsuo: *See*—
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Nakata, Hozumi, to Nihon Dempa Kogyo Co., Ltd. Mechanism and method for supporting a tuning fork-type quartz crystal element. 4,131,816, Cl. 310-348.000.

Namba, Susumu; and Aoyagi, Yoshinobu, to Rikagaku Kenkyusho. Method of producing echelette gratings. 4,131,506, Cl. 156-643.000.

Narang, Rajendra K. Alignment bushing. 4,131,385, Cl. 408-241.00B.

Narasimha, Madihally J., to Granger Associates. Digital filter bank. 4,131,766, Cl. 179-15.0FD.

Narita, Kenichi: *See*—
Kurono, Masayasu; Toda, Masaaki; Niwa, Haruki; Kosuge, Syunji; Iida, Takahumi; and Narita, Kenichi, 4,131,747, Cl. 562-469.000.

Nastasi, Guy. Lock top for folding carton. 4,131,229, Cl. 229-39.00R.

National Research Development Corporation: *See*—
Gray, Kenneth W., 4,131,889, Cl. 343-8.000.
Mansfield, Wilfred P., 4,131,093, Cl. 123-41.850.

National Research Institute for Metals: *See*—
Satoh, Mitsunori; Hijikata, Masayuki; Maeda, Hiroshi; and Morimoto, Ichiro, 4,131,458, Cl. 75-173.00R.

National Starch and Chemical Corporation: *See*—
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Naumann, Gunter: *See*—
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Neat, Frank: *See*—
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Nelson, Frank M.: *See*—
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Neuer, Gunther: *See*—
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Newhard, Nelson J., Jr., to Amchem Products, Inc. Chromate conversion composition and method for coating aluminum using low concentrations of chromate, phosphate and fluoride ions. 4,131,489, Cl. 148-6.160.

Newman, George R.; and Lund, Raymond R., to Canron Railgroup. Spike driver. 4,131,067, Cl. 104-17.00R.

Newsome, Norman M.: *See*—
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Nichi-Ei Bussan Co., Ltd.: *See*—
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Nichicon Capacitor, Ltd.: *See*—
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Nichols, Wayne C.: *See*—
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Niehenke, Edward C.; and Klein, Gerald I., to Westinghouse Electric Corp. Beam lead dual parametric amplifier. 4,131,858, Cl. 330-4.900.

Niezgoda, Anna: *See*—
Kiedik, Maciej; Grzywa, Edward; Kolt, Jozef; Terelak, Kazimierz; Czyz, Jerzy; and Niezgoda, Anna, 4,131,749, Cl. 568-781.000.

Nifco, Inc.: *See*—
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Nihon Dempa Kogyo Co., Ltd.: *See*—
Nakata, Hozumi, 4,131,816, Cl. 310-348.000.

Nikitits, Edwin; and Demers, Jean G., to Markus, Franklyn M. Combined folding table and seat assembly. 4,131,311, Cl. 297-159.000.

Ninomiya, Takeshi, to Sony Corporation. Parallel-serial analog to digital converters. 4,131,885, Cl. 340-347.0AD.

Nippon Electric Company, Ltd.: *See*—
Fujine, Nobuhiko; and Nakajima, Masato, 4,131,911, Cl. 357-74.000.
Tsuchiya, Takuichi; and Shinagawa, Shinichi, 4,131,927, Cl. 361-6.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippon Mining Co., Ltd.: *See*—
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Nippon Oil Company Limited: *See*—
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Nippon Soken, Inc.: *See*—
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,131,086, Cl. 123-3.000.
Sawada, Daisaku; Goto, Kenji; Shigemaut, Takashi; Takeda, Yuji; Hattori, Tadashi; Yamaguchi, Hiroaki; and Nishida, Minoru, 4,131,097, Cl. 123-117.00R.

Nippon Steel Corporation: *See*—
Oishi, Akiyoshi; Harada, Tamotsu; and Ishikawa, Takashi, 4,131,490, Cl. 148-9.500.
Sasaki, Minoru; Ito, Kaoru; Minamida, Katsuhiro; and Fujita, Keiki, 4,131,668, Cl. 264-40.400.

Nippondenso Co., Ltd.: *See*—
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Nischk, Gunther: *See*—
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Nishida, Minoru: *See*—
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Nishikawa, Shigeyoshi; Muroshima, Takashi; Sakaguchi, Hirokazu; Hasebe, Morihiko; Katagiri, Katsuji; and Inoue, Kazuo, to Nichicon Capacitor, Ltd. Impregnated capacitor. 4,131,931, Cl. 361-315.000.

Nishimura, Toshimichi: *See*—
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Nissan Motor Company, Ltd.: *See*—
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Niwa, Haruki: *See*—
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Niwa, Kazuo: *See*—
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Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel having an improved drag mechanism. 4,131,245, Cl. 242-217.000.

Noda, Shiro, to Okuma Machinery Works Ltd. Interference prevention system for machine tool movable members. 4,131,836, Cl. 318-565.000.

Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, to Nippon Soken, Inc. Fuel reforming apparatus for use with internal combustion engine. 4,131,086, Cl. 123-3.000.

Nojima, Shoiti: *See*—
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Nomura, Masahiro; and Hirabayashi, Yutaka, to Somar Manufacturing Co., Ltd. Photographic method of making relief member with negative dye image. 4,131,466, Cl. 96-49.000.

Nonoyama, Tikahiro, to Sanmeidenki Kabushikikaisha. Load-bearing surface for a solenoid. 4,131,719, Cl. 428-598.000.

Norco Industries, Inc.: *See*—
John, Julius F., 4,131,263, Cl. 254-8.00B.

Norcross, James E., to Arcos Corporation. Electroslag boss and process. 4,130,931, Cl. 29-527.500.

Norris Industries, Inc.: *See*—
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North, James C.: *See*—
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Northern Instruments Corporation: *See*—
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Nouvertne, Werner: *See—*
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Oce-Industries Inc.: *See—*
Kufrin, Fred W.; and Carpentier, John H., 4,131,273, Cl. 271-4.000.
Oceanography International Corporation: *See—*
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Ochi, Shuhei: *See—*
Araki, Masakatsu; Ochi, Shuhei; Kusunoki, Toshio; Ishii, Teizi; and Sakata, Shinichi, 4,131,121, Cl. 132-7.000.
O'Connor, Burdett H.: *See—*
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Oda, Denichi: *See—*
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Offshore Devices Inc.: *See—*
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Ogden, John M. Tennis racket and stringing method. 4,131,279, Cl. 273-73.00D.
Ogren, Sven O.: *See—*
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Ohashi, Hiroshi: *See—*
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Ohashi, Yutaka, to Tonka Corporation. Running toy with a flywheel. 4,130,963, Cl. 46-209.000.
Ohio-Nuclear, Inc.: *See—*
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Oishi, Akiyoshi; Harada, Tamotsu; and Ishikawa, Takashi, to Nippon Steel Corporation. Method for scarfing surface defects of a metal piece. 4,131,490, Cl. 148-9.500.
Ojiri, Kozo; and Sakai, Kohzo, to Asahi Glass Company Limited. Removing rutile from zircon electrostatically. 4,131,539, Cl. 209-127.00A.
Okada, Minoru: *See—*
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Okumura, Takatoshi; and Okamoto, Shimaji, 4,131,049, Cl. 84-1.010.
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Okamura, Yuichi: *See—*
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Okazaki, Kichizaemon: *See—*
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Okazaki, Yashushi: *See—*
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Okidata Corporation: *See—*
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Okumura, Nobuya: *See—*
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Okumura, Takatoshi; and Okamoto, Shimaji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument having memories containing waveshapes of different type. 4,131,049, Cl. 84-1.010.
Olin Corporation: *See—*
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Olsen, Roger F.; and Cantley, George, to Incom International Inc. Adjustable interlock hand lever. 4,131,037, Cl. 74-876.000.
Olsson, Knut A. G.; Astrom, Karl P. E.; and Johansson, Johan C., to Ifo Sanitar AB. Method and apparatus for removing filterable substances from a liquid. 4,131,546, Cl. 210-77.000.
Olympus Optical Co., Ltd.: *See—*
Kimura, Tadashi, 4,131,335, Cl. 350-218.000.
Kimura, Tadashi; and Watanabe, Fumitaka, 4,131,355, Cl. 354-225.000.
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Ono, Koichi; Takahara, Toshiyuki; and Ito, Tetsuyoshi, to Daicel Ltd. Gas generator for inflatable vehicle collision bag. 4,131,299, Cl. 280-736.000.
Ono Pharmaceutical Co., Ltd.: *See—*
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Ono, Yusuke: *See—*
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Onoda Cement Company, Ltd.: *See—*
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Orion Research Incorporated: *See—*
Diggens, Albert A., 4,131,428, Cl. 23-230.00R.
Orscheln Lever Sales Co.: *See—*
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Osborne, Bodwell D., to Standard Oil Company (Indiana). VMP riser horizontal bearing. 4,130,995, Cl. 405-224.000.
Oshima, Ryoichiro: *See—*
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Oshiyama, Hiroichi: *See—*
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Osterloh, Rolf; Jacobi, Manfred; and Kuesters, Werner, to BASF Aktiengesellschaft. Photoinitiators for photopolymerizable coating compositions. 4,131,529, Cl. 204-159.140.
Otis Elevator Company: *See—*
Krauer, Otto A., 4,131,183, Cl. 187-29.00R.
Ouchi, Keido, to Nissan Motor Company, Ltd. Internal combustion engine operated on a reformed gas. 4,131,095, Cl. 123-59.0EC.
Outboard Marine Corporation: *See—*
Cavil, David T.; McAuliffe, Gerald N.; and Van Rens, Russell J., 4,131,832, Cl. 318-358.000.
McAuliffe, Gerald N.; and Wooters, Eldon W., 4,131,833, Cl. 318-440.000.
Outram, John D., to Plessey Handel und Investments AG. Spectral analysis. 4,131,890, Cl. 343-108.00M.
Ouyang, Paul H. Short-channel V-groove complementary MOS device. 4,131,907, Cl. 357-42.000.
Ovcharenko, Vladimir G.: *See—*
Muzhzhavlev, Konstantin D.; Yazev, Vladimir D.; Schegolev, Vladimir I.; Ivanov, Andrei B.; Vasiliev, Alexei V.; Romanenko, Oleg N.; Kosarev, Sergei P.; and Ovcharenko, Vladimir G., 4,131,522, Cl. 204-60.000.
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Oyama, Tadao, to Hitachi, Ltd. Apparatus for removing a shadow mask assembly from a panel and inserting same into a dummy panel. 4,130,919, Cl. 29-25.190.
Paczuski, Andrew W.: *See—*
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Paisker, Ernst: *See*—
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Pajakowski, Lawrence R.: *See*—
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Pakulis, Ivars E., to Kay-Ray, Inc. Microwave moisture sensor chute. 4,131,845, Cl. 324-58.50A.
Pallant, Joseph; and Johndrow, John P., to H. R. Turner (Willenhall) Limited. Vehicle seats. 4,131,316, Cl. 297-341.000.
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Palotay, Joseph C.: *See*—
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Pap-et, Inc.: *See*—
Goldenberg, Joseph, 4,131,278, Cl. 273-67.00R.
Papadakis, Edythe A. Zipper-type window for homes. 4,131,150, Cl. 160-368.00R.
Paper Converting Machine Company: *See*—
Hartnig, Richard E., 4,131,272, Cl. 270-73.000.
Slawny, Howard J., 4,131,271, Cl. 270-40.000.
Park, Dong-Sil: *See*—
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Patterson, William W., III; and Grapes, Eugene F. Load binder apparatus. 4,131,264, Cl. 254-67.000.
Patton, Donna J.; and Riess, Robert G., to Bell & Howell Company. Carrying and storage case. 4,131,227, Cl. 229-8.000.
Patton, Roy D.; and Rietveld, Frank P. Christmas tree holder. 4,130,965, Cl. 47-40.500.
Paulen, Hendrikus J. G., to Stamicarbon, B.V. Process for the preparation of tacky mixtures based on rubbery ethene copolymers. 4,131,634, Cl. 260-845.000.
Payette, Lionel J.: *See*—
Karkoski, Joseph; Payette, Lionel J.; and Shurboff, John D., 4,131,714, Cl. 428-379.000.
Pearce, Charles W.; and Zaleckas, Vincent J., to Western Electric Company, Inc. Gettering semiconductor wafers with a high energy laser beam. 4,131,487, Cl. 148-1.500.
Pedgonay, John S. Firing torque error control system for rifled ordinance. 4,130,959, Cl. 42-75.00B.
Peinecke, Ludwig: *See*—
Blankenmeister, Anton; Peinecke, Ludwig; and Koob, Dieter, 4,131,197, Cl. 206-387.000.
Pelly, Brian R.; and Wood, Peter, to Electric Power Research Institute, Inc. Naturally commutated voltage-fed converter for linking a DC source to an AC system. 4,131,937, Cl. 363-96.000.
Penco, Sergio; Angelucci, Francesco; and Arcamone, Federico, to Societa Farmaceutici Italia S.p.A. Daunorubicin derivatives, their preparation and their use. 4,131,649, Cl. 424-180.000.
Peng, Sung S. Eyelids-turning and eye-washing fixture. 4,131,115, Cl. 128-249.000.
Pennwalt Corporation: *See*—
Popoff, Ivan C.; and Haines, Paul G., 4,131,622, Cl. 260-576.000.
Peregudov, Lev V.; and Malashin, Mikhail M. Chill-free foundry iron. 4,131,456, Cl. 75-124.000.
Perkin-Elmer Corporation, The: *See*—
Minar, Frank M.; and Abitante, Peter A., 4,131,328, Cl. 339-14.00R.
Perolin Company, Inc., The: *See*—
Scott, James F., 4,131,433, Cl. 44-51.000.
Perrey, Hermann; Matner, Martin; and Sinn, Gustav, to Bayer Aktiengesellschaft. Heat sensitizing mixture comprising an amide and a heat sensitizing agent which is a poly(alkylene oxide) containing urethane groups. 4,131,603, Cl. 528-45.000.
Perrone, George L.; Boorman, Robert W.; Holbrook, Michael R.; and Zanelli, Eugene A., to Garrett Corporation, The. Centrifugal compressor with improved range. 4,131,389, Cl. 415-211.000.
Pert, Maurice R.: *See*—
Sheppard, Stewart A.; Arbib, Philip B.; and Pert, Maurice R., 4,130,912, Cl. 15-210.00R.
Pescetto, James R., to L. R. Nelson Corporation. Adjustable bubbler sprinkler head. 4,131,234, Cl. 239-457.000.
Pessolano, Arsenio A.: *See*—
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,131,677, Cl. 424-256.000.
Peterson, C. Lynn, to Peterson Filters Corporation. Rotary disc filter scraper apparatus. 4,131,548, Cl. 210-331.000.
Peterson, Dennis R. Method and apparatus for accelerating a filament and the like. 4,131,045, Cl. 83-403.000.
Peterson Filters Corporation: *See*—
Peterson, C. Lynn, 4,131,548, Cl. 210-331.000.
Petit, Leon; Davin, Andre; and Gueguen, Jacques, to Institut National de la Recherche Agronomique. Process for obtaining purified protein isolates. 4,131,607, Cl. 260-123.500.
Petitpierre, Jean C., to Ciba-Geigy Corporation. Azo color former containing heat-sensitive recording material. 4,131,695, Cl. 427-148.000.
Petropoulos, Constantine C., to Eastman Kodak Company. Radiation sensitive polymeric o-nitrophenyl acetals and element. 4,131,465, Cl. 96-35.000.
Pettit, Donald; and Abbott, Stephen G., to Shoe and Allied Trades Research Association, The. Providing control signals for machine operations. 4,131,918, Cl. 360-1.000.
Pevrick Engineering Company, Inc.: *See*—
Hedrick, John R., 4,131,116, Cl. 128-305.000.
Pews, R. Garth, to Dow Chemical Company, The. Preparation of 2-chloro-4-toluenesulfonyl chloride. 4,131,619, Cl. 260-543.00R.
Pfannmuller, Joachim: *See*—
Bottcher, Hubert; Pfannmuller, Joachim; Kaebernick, Hartmut; Steiniger, Wolfgang; and Preuss, Horst-Dieter, 4,131,501, Cl. 156-157.000.
Pfleiderer, Hans-Joerg: *See*—
Knauer, Karl; and Pfleiderer, Hans-Joerg, 4,131,810, Cl. 307-311.000.
Pflieger, Bernard; Sauvage, Philippe; and Tombrel, Francis, to Compagnie Generale des Etablissements Michelin. Reactive gaseous cooling medium for the manufacture of wire. 4,131,151, Cl. 164-89.000.
Pham, Kha M.: *See*—
Dalibard, Gerard; and Pham, Kha M., 4,131,723, Cl. 429-81.000.
Philip Morris Incorporated: *See*—
Gellatly, Grant; and Uhl, Richard G., 4,131,118, Cl. 131-140.00C.
Kite, George F.; Gellatly, Grant; and Uhl, Richard G., 4,131,117, Cl. 131-140.00C.
Phillips Petroleum Company: *See*—
Erickson, Wayne K.; and Walters, John P., 4,131,704, Cl. 428-95.000.
Farfaglia, Silvio T., 4,131,057, Cl. 93-81.00R.
Hsieh, Henry L.; and Udipi, Kishore, 4,131,653, Cl. 260-880.00B.
Hughes, William B., 4,131,630, Cl. 260-666.0PY.
Lacquement, Ralph G., 4,131,161, Cl. 166-265.000.
Reusser, Robert E., 4,131,559, Cl. 252-171.000.
Reusser, Robert E., 4,131,560, Cl. 252-171.000.
Reusser, Robert E., 4,131,561, Cl. 252-171.000.
Udipi, Kishore, 4,131,725, Cl. 526-56.000.
Phillips, Wayne M.: *See*—
United States of America, National Aeronautics and Space Administration; and Phillips, Wayne M., 4,131,459, Cl. 75-203.000.
Photonic Systems, Inc.: *See*—
Shoberg, Robert D., 4,131,343, Cl. 352-84.000.
Pichon, Jean-Louis E.: *See*—
Volat, Jean-Pierre; and Pichon, Jean-Louis E., 4,131,320, Cl. 302-2.00R.
Pignocco, Arthur J.: *See*—
Kachik, Robert H.; and Pignocco, Arthur J., 4,131,473, Cl. 106-1.120.
Pilkington Brothers Limited: *See*—
Dickinson, George A., 4,131,446, Cl. 65-99.00A.
Hodgkinson, Joseph B., 4,131,222, Cl. 225-3.000.
Pioneer Magnetics: *See*—
Berger, James K., 4,131,920, Cl. 360-51.000.
Piret, Norbert L.; Hopper, Meinolf; and Kudelka, Herbert, to Duisburger Kupferhutte. Process for recovering silver and gold from chloride solutions. 4,131,454, Cl. 75-83.000.
Pirovano, Dante, to Industrie Pirelli S.p.A. Device for the mutual centering of relatively movable mechanic elements, particularly used on tire curing presses. 4,131,402, Cl. 425-38.000.
Pitney-Bowes, Inc.: *See*—
Dlugos, Daniel F., 4,131,946, Cl. 364-466.000.
Hordeski, Edward R.; Canevari, Louis T.; and Macari, Leonard J., 4,131,168, Cl. 177-128.000.
Pizarek, Patrick J.: *See*—
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Plate, Gary G., to A.T.R. Equipment Industries Ltd. Method and apparatus for sealing and cutting thermoplastic material. 4,131,503, Cl. 156-250.000.
Plessey Handel und Investments AG: *See*—
Outram, John D., 4,131,890, Cl. 343-108.00M.
Pohanka, Robert C.: *See*—
Walker, Basil E.; Pohanka, Robert C.; Smith, Paul L.; and Rice, Roy W., 4,131,444, Cl. 65-32.000.
Polaroid Corporation: *See*—
Fitzgerald, Maurice J., 4,131,471, Cl. 96-114.000.
Hardy, Herbert L., 4,131,344, Cl. 352-130.000.
Pollinzi, Angeline D. Automatic shower dispenser. 4,131,232, Cl. 239-314.000.
Pollitzer, Ernest L.: *See*—
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., 4,131,628, Cl. 260-666.00A.
Polly, John R., Jr. Ball throwing sling. 4,131,102, Cl. 124-5.000.
Poortman, Karel A. Electronic tee off device. 4,131,280, Cl. 273-184.00R.
Pope, Darrel L. High fidelity speaker system. 4,131,179, Cl. 181-156.000.
Pope, John A.: *See*—
Rennison, Stuart C.; Pope, John A.; and Andrews, Timothy D., 4,131,468, Cl. 96-75.000.
Popoff, Ivan C.; and Haines, Paul G., to Pennwalt Corporation. Purification of N,N'-disubstituted p-phenylenediamine antiozonants and oil stabilizers. 4,131,622, Cl. 260-576.000.
Porst, Alfred: *See*—
Dannhauser, Friedrich; and Porst, Alfred, 4,131,339, Cl. 357-13.000.

Porteous, Kenneth, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Alberta Syncrude Equity; Ontario Energy Corporation; Imperial Oil Limited; Canada-Cities Service, Ltd.; and Gulf Oil Canada Limited. Treatment of tumbler reject. 4,131,535, Cl. 208-11.0LE.

Porterfield, Richard F., to SCM Corporation. Dual segment continuous motion ribbon feed mechanism. 4,131,374, Cl. 400-232.000.

Powell, Aaron. Illuminated dancing shoes. 4,130,951, Cl. 36-137.000.

Powers, Thomas R., to TRW Inc. Insert type drill and insert therefor. 4,131,383, Cl. 407-114.000.

PPG Industries, Inc.: *See*—
Ammons, Vernon G., 4,131,605, Cl. 528-77.000.
Ammons, Vernon G., 4,131,606, Cl. 528-58.000.
Klockenga, Michael E., 4,131,445, Cl. 65-40.000.
Martinsons, Aleksandrs; and Crenshaw, Marilyn, 4,131,519, Cl. 204-38.00B.

Precision Monolithics, Inc.: *See*—
Comer, Donald T., 4,131,884, Cl. 340-347.0CC.

Preedy, John E.: *See*—
Drake, Paul H.; Humphris, Colin J.; and Preedy, John E., 4,131,481, Cl. 521-91.000.

Preh, Elektro-Feinmechanische Werke, Jakob Preh Nachf: *See*—
Hilgendorf, Joachim; and Funke, Karl-Heinz, 4,131,870, Cl. 338-183.000.

Prehodka, Barry V.: *See*—
Lee, Maw H.; and Prehodka, Barry V., 4,131,830, Cl. 318-266.000.

President and Fellows of Harvard College: *See*—
Lange, Louis G., III; and Vallee, Bert L., 4,131,727, Cl. 526-23.000.

Preston, Sidney. Adjustable eyeglass temple. 4,131,340, Cl. 351-118.000.

Preuss, Horst-Dieter: *See*—
Bottcher, Hubert; Pfannmuller, Joachim; Kaebernick, Hartmut; Steiniger, Wolfgang; and Preuss, Horst-Dieter, 4,131,501, Cl. 156-157.000.

Price, Robert J. Outdoor furniture with removable weather cover. 4,131,312, Cl. 297-184.000.

Priddy, Duane B., to Dow Chemical Company, The. Method for polymerizing olefinically unsaturated monomers employing a catalyst composition comprising (a) shock-sensitive organic peroxide and (b) an olefinic unsaturated non-homopolymerizable monomer. 4,131,728, Cl. 526-204.000.

Pridy, Whetstine B. Tubular member straightening, descaling and hydraulic testing apparatus. 4,131,005, Cl. 72-40.000.

Prilutsky, Valery P.: *See*—
Gurevich, Samuil M.; Zamkov, Vadim N.; and Prilutsky, Valery P., 4,131,493, Cl. 148-23.000.

Printy, Davey L.: *See*—
Wright, Norman Z.; and Printy, Davey L., 4,131,033, Cl. 74-553.000.

Privon, George T.; and Paczuski, Andrew W., to Sundstrand Corporation. Hermetic compressor lubrication system with two-stage oil pump. 4,131,396, Cl. 417-372.000.

Procter & Gamble Company, The: *See*—
Bailey, John; Randell, Michael J.; and Sherrington, Paul R., 4,131,558, Cl. 252-135.000.

Production Research, Inc.: *See*—
Kujawa, Anthony, Jr.; and Kujawa, Frank J., 4,130,966, Cl. 49-141.000.

Progressive Research Products, Inc.: *See*—
Carosello, Theodore F., 4,131,543, Cl. 210-36.000.

Proizvodstvennoe Obiedinenie "Baz": *See*—
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,131,184, Cl. 192-3.260.

Pryor, Robert A.: *See*—
Keeling, Michael C.; Bailey, William L.; Coleman, Michael G.; Lesk, Israel A.; and Pryor, Robert A., 4,131,755, Cl. 136-89.00P.
Lesk, Israel A.; and Pryor, Robert A., 4,131,488, Cl. 148-1.500.

Pryor, Timothy R. Method and apparatus for determining object position and dimension using a diffraction wave. 4,131,365, Cl. 356-356.000.

psb-Pfalzstahlbau GmbH: *See*—
Kuwertz, Erich, 4,131,068, Cl. 104-172.00S.

Pugsley, Thomas A.: *See*—
Ferland, Jean-Marie; Laliberte, Real; Lippman, Wilbur; and Pugsley, Thomas A., 4,131,745, Cl. 560-252.000.

Pullman Incorporated: *See*—
Glassmeyer, John J., 4,131,071, Cl. 108-53.100.

Puna, Erich, to Brundell och Jonsson AB. Tree cutting device. 4,131,145, Cl. 144-34.00E.

Purrmann, Robert: *See*—
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dietrich, 4,131,729, Cl. 526-282.000.

Quenot, Michel, to Stanley-Mabo S.A. Tape measure brake. 4,131,244, Cl. 242-107.200.

Quiogue, Honesto D., to Harvey Hubbell, Incorporated. Lamp ballast attachment device. 4,131,867, Cl. 336-65.000.

R. A. Jones & Co. Inc.: *See*—
Koehlinger, Allen W.; and Fox, Norman J., 4,131,230, Cl. 229-40.000.

R. A. Pearson Company: *See*—
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R.C.A. Rubber Company, The: *See*—
Davis, Fred R., 4,131,592, Cl. 260-23.70R.

Racal Group Services Limited: *See*—
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Radke, Donald G.; and Lewis, Donald J., to Allied Chemical Corporation. Inflator for automobile safety device. 4,131,300, Cl. 280-737.000.

Radkowski, Edward J.: *See*—
Siegel, Harvey L.; Muething, Gerald F., Jr.; and Radkowski, Edward J., 4,131,941, Cl. 364-200.000.

Radlmann, Eduard; Reinehr, Ulrich; Hoffmann, Peter; Arlt, Dieter; and Nischk, Gunther, to Bayer Aktiengesellschaft. Crosslinked acrylonitrile copolymers. 4,131,724, Cl. 526-16.000.

Raidel, John E. Double axle suspension. 4,131,297, Cl. 280-682.000.

Railway Engineering Associates, Inc.: *See*—
List, Harold A., 4,131,069, Cl. 105-168.000.

Rakow, Donald E., to Liquid Paper Corporation. Typewriter ribbon cartridge. 4,131,373, Cl. 400-208.000.

Ramet, Gilbert, to Ebauches S.A. Electronic watch, especially electro-optic display watch. 4,130,986, Cl. 58-23.00R.

Ramlow, Kurt: *See*—
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Randall, Everett H., to Fram Corporation. Multi-size rain hood. 4,131,441, Cl. 55-385.00R.

Randell, Michael J.: *See*—
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Randolph, Arthur J., to Tuftamatic, Inc. Quilting button part holder. 4,130,935, Cl. 29-706.000.

Randolph, John L. Bowling ball. 4,131,277, Cl. 273-63.00D.

Randon, Jean-Louis R. G.; and Slama, Georges S., to Association pour la Recherches et le Developpement des Methodes et Processus Industriels. Method of coating carbon filaments with silicon carbide. 4,131,697, Cl. 427-249.000.

Rangabe, Alexander R. Damper means for damping the resonance of disc record tone arms. 4,131,284, Cl. 274-23.00R.

Range, Richard J., to Baxter Travenol Laboratories, Inc. Tip wiper apparatus and method. 4,131,426, Cl. 141-1.000.

Rank Xerox Limited: *See*—
Honda, Ko, 4,131,359, Cl. 355-15.000.

Rasile, John: *See*—
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Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,131,659, Cl. 264-25.000.

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Raven, Neil A. Wringer type mop. 4,130,910, Cl. 15-120.00A.

Ray-Chaudhuri, Dilip K.: *See*—
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Raybestos-Manhattan, Inc.: *See*—
DeFrank, Michael P., 4,131,590, Cl. 260-37.0EP.
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Kagan, Naum Y.; Bortnik, Vladimir M.; Korenbljum, Isai V.; Razumeev, Jury A.; Lyass, Abram M.; Borsuk, Pavel A.; Usubov, Zokhrab G. O.; and Dmitrieva, Valentina A., 4,131,477, Cl. 106-38.350.

RCA Corporation: *See*—
Branton, Tom W., 4,131,822, Cl. 313-403.000.
Credelle, Thomas L., 4,131,823, Cl. 313-422.000.
Deckert, Cheryl A., 4,131,698, Cl. 427-304.000.
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Larrabee, Robert D., 4,131,827, Cl. 318-46.000.
Mezrich, Reuben S.; and Koenig, Edwin T., 4,131,021, Cl. 73-606.000.
Mezrich, Reuben S., 4,131,022, Cl. 73-606.000.
Mezrich, Reuben S.; and Anderson, Charles H., 4,131,023, Cl. 73-606.000.
Mezrich, Reuben S.; and Vilkomerson, David H. R., 4,131,024, Cl. 73-606.000.
Mezrich, Reuben S.; and Avins, Jeremiah Y., 4,131,025, Cl. 73-606.000.
Weitzel, Charles E.; and Capewell, David R., 4,131,496, Cl. 148-175.000.

Ready, Bernard W.: *See*—
Gordon, Manfred; and Ready, Bernard W., 4,131,369, Cl. 366-146.000.

Rebsch, Donald L. Biorhythm indicator. 4,131,790, Cl. 235-89.00R.

Reddy, Junuthula N., to Bendix Corporation, The. Multiple function pressure sensor. 4,131,088, Cl. 123-32.0EJ.

Reddy, Reddy R. V.; and Jolley, Michael E., to Abbott Laboratories. Array gamma counter. 4,131,798, Cl. 250-328.000.

Redmayne, William H.; and Berry, David, to Laporte Industries Limited. Water treatment. 4,131,545, Cl. 210-47.000.

Regnier, Jean: *See*—
Grosclaude, Gerard; Regnier, Jean; and Cavarroc, Marcel, 4,131,688, Cl. 426-40.000.

Reichhold Chemicals, Inc.: *See*—
Kirkpatrick, Harold B.; Distler, Edward C.; and Menzin, Marvin, 4,131,114, Cl. 128-90.000.

Reid, Anthony, to Bell Telephone Laboratories, Incorporated. Buffer storage assignment arrangement for time-division switching systems. 4,131,762, Cl. 179-15.0AQ.

Reid, Billy G.: *See—*
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Reimschuessel, Herbert K.: *See—*
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Reinehr, Ulrich: *See—*
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Research Frontiers Incorporated: *See—*
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Reusser, Robert E., to Phillips Petroleum Company. Azeotropic compositions. 4,131,559, Cl. 252-171.000.

Reusser, Robert E., to Phillips Petroleum Company. Azeotropic compositions. 4,131,560, Cl. 252-171.000.

Reusser, Robert E., to Phillips Petroleum Company. Azeotropic compositions. 4,131,561, Cl. 252-171.000.

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Rhone-Poulenc Industries: *See—*
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Rich, Dennis E.; and Steigerwald, Conrad J., to Honeywell Information Systems Inc. Apparatus for cutting and removing dry film photoresist from printed wire boards. 4,131,042, Cl. 83-100.000.

Richardson-Merrell Inc.: *See—*
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Richardson, Philip; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; and Criswell, Thomas, to Xerox Corporation. Watch dog timer module for a controller. 4,131,945, Cl. 364-200.000.

Richardson, Philip: *See—*
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Richey, Vernon T. Releasable drill string stabilizer. 4,131,167, Cl. 175-323.000.

Rickards, Michael A., to Rohr Industries, Incorporated. Heave alleviation and control device for a surface effect ship. 4,131,174, Cl. 180-118.000.

Rickerd, Calvin P.: *See—*
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Ricoh Company, Ltd.: *See—*
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Ries, Karl; Kaiser, Dieter; and Jannsen, Klaus-Uwe, to Mannesmannrohren-Werke AG. Ultrasonic testing of seams. 4,131,026, Cl. 73-625.000.

Ries, Karl: *See—*
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Rinfret, Arthur P., to Union Carbide Corporation. Thermoplastic blood bag. 4,131,200, Cl. 206-484.000.

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Rio Algom Limited: *See—*
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Riss, Gerhard, to Durkoppwerke GmbH. Method of and apparatus for the sewing of a multiplicity of stitch groups in a workpiece. 4,131,074, Cl. 112-121.140.

Rivetti, Enrico: *See—*
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Wanner, Karl; Bleicher, Manfred; and Falchle, Jorg, 4,131,165, Cl. 173-48.000.
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Roberts, Durward T., Jr., to Firestone Tire & Rubber Company, The. Polyurethane tire sidewalls. 4,131,149, Cl. 152-357.00A.

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Roberts, Raymond J., to Consarc Corporation. Automatic melt rate control system for consumable electrode remelting. 4,131,754, Cl. 13-34.000.

Robertshaw Controls Company: *See—*
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Tyler, Hugh J., 4,131,789, Cl. 219-541.000.

Robertson, Carl L. Water closet lid cover. 4,130,906, Cl. 4-242.000.

Robinson, Frank D., to Robinson Helicopter Co. Rotor hub and oil seal. 4,131,391, Cl. 416-140.000.

Robinson Helicopter Co.: *See—*
Robinson, Frank D., 4,131,391, Cl. 416-140.000.

Robinson, Paul B. Communication system including addressing apparatus for use in remotely controllable devices. 4,131,881, Cl. 340-167.00R.

Robinson, Ralph O. Apparatus for isolating from ground and exciting a conductive tower for use as a vertical antenna. 4,131,895, Cl. 343-792.000.

Robinson, Roy D.: *See—*
Flinn, Robert W.; and Robinson, Roy D., 4,131,415, Cl. 264-138.000.

Rocchitelli, Onofrio. Glass washing electromagnetic pump, more particularly for windscreens of motor vehicles. 4,131,398, Cl. 417-418.000.

Rockwell, Harvey W., to Fiat-Allis Construction Machinery, Inc. Pilot controlled variable displacement fluid motor. 4,131,056, Cl. 91-492.000.

Rockwell International Corporation: *See—*
Wright, Norman Z.; and Printy, Davey L., 4,131,033, Cl. 74-553.000.

Rodseth, William G., to Schlage Lock Company. Door closer. 4,130,913, Cl. 16-49.000.

Rody, Jean: *See—*
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,131,599, Cl. 260-45.80N.

Rogers, Joe E. Method and apparatus for emptying the contents of a tank carried by an engine-powered vehicle. 4,131,214, Cl. 222-1.000.

Rohland, Gerhard, to Gerro Gerhard Rohland AB. Cable joint and method of making same. 4,131,377, Cl. 403-14.000.

Rohm and Haas Company: *See—*
Brendley, William H., Jr., 4,131,572, Cl. 260-17.00R.
Brown, Milton S.; Burch, Richard M.; and Warth, Guy M., 4,131,641, Cl. 423-34.000.
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,131,580, Cl. 260-29.6RW.
Emmons, William D.; and Swift, Graham, 4,131,736, Cl. 560-14.000.
Frankel, Lawrence S., 4,131,715, Cl. 428-413.000.

Rohr Industries, Incorporated: *See—*
Rickards, Michael A., 4,131,174, Cl. 180-118.000.

Rolf, Mayer, to Bosch-Siemens Hausgerate GmbH. Electromotively driven drive equipment, especially for kitchen appliances or the like. 4,131,034, Cl. 74-799.000.

Rolls-Royce Limited: *See—*
Amsbury, Clifford R., 4,130,941, Cl. 33-174.00L.

Romanenko, Oleg N.: *See—*
Muzhzhavlev, Konstantin D.; Yazev, Vladimir D.; Schegolev, Vladimir I.; Ivanov, Andrei B.; Vasiliev, Alexei V.; Romanenko, Oleg N.; Kosarev, Sergei P.; and Ovcharenko, Vladimir G., 4,131,522, Cl. 204-60.000.

Rose, Charles D.; and Gilbert, Frederick W., to Riley-Beaird, Inc. Method of separating a predetermined fraction from petroleum oil using multistage evaporators. 4,131,538, Cl. 208-352.000.

Roth, Jerome: *See—*
Mordarski, Walter J.; and Roth, Jerome, 4,131,511, Cl. 176-68.000.

Rotmans, Richard J., to Textron Inc. Thrust vector control actuation system. 4,131,246, Cl. 244-3.220.

Rousseau, John F., Jr.; and Babin, Charles E. Wind rotated reflective scarecrow. 4,131,079, Cl. 116-22.00A.

Rowe, Frederick J.: *See—*
Milberger, Walter E.; and Rowe, Frederick J., 4,131,938, Cl. 363-101.000.
RTE Corporation: *See—*
Flatt, Richard P., 4,131,329, Cl. 339-111.000.
Ruben, Samuel. Method for making positive electrode for lead-sulfuric acid storage battery. 4,131,515, Cl. 204-2.100.
Ruby, Joseph H., to Sperry Rand Corporation. Pneumatic pressure control valve. 4,131,130, Cl. 137-596.170.
Ruddle, Ronald W.; and Neat, Frank, to Foseco Trading AG. Feeding unit for a casting. 4,131,152, Cl. 164-359.000.
Rumball, Kenneth F., to Airfix Industries Limited. Containers. 4,131,212, Cl. 215-252.000.
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., to Tsentralny Nauchno Issledovatelsky Avtomobilny i Avtomotorny Institut Nami; and Proizvodstvennoe Obiedinenie "Baz". Vehicle hydraulic transmission. 4,131,184, Cl. 192-3.260.
Ruoff, Manfred, to Robert Bosch GmbH. Hydraulic steering arrangement. 4,131,176, Cl. 180-131.000.
Rusinek, Stanley, Jr.; and Spector, George. Energy saving fireplace. 4,131,106, Cl. 126-121.000.
Rutzmoser, Hermann: *See—*
Becker, Harry; Doerflinger, Karl; Ey, Klaus; Reiter, Georg; Rutzmoser, Hermann; and Theus, Richard, 4,131,934, Cl. 361-428.000.
Ryan, Charles W., to Eli Lilly and Company. Process for preparing cis-hexahydrodibenzopyranones. 4,131,614, Cl. 260-345.300.
Ryan, Charles W.: *See—*
Dominianni, Samuel J.; and Ryan, Charles W., 4,131,656, Cl. 260-951.000.
Ryan, Frederick M.; and Handke, Paul C., to Westinghouse Electric Corp. Tagging particles which are easily detected by luminescent response, or magnetic pickup, or both. 4,131,064, Cl. 102-1.00R.
Ryno, Robert W., to A. O. Smith Corporation. Self-contained electric igniter with rechargeable battery. 4,131,413, Cl. 431-44.000.
Safety Jet Skisicherheitsbugel GmbH: *See—*
Thon, Dieter, 4,131,291, Cl. 280-11.37E.
Safir, Sidney R.: *See—*
Fanshawe, William J.; Epstein, Joseph W.; Crawley, Lantz S.; Hofmann, Corris M.; and Safir, Sidney R., 4,131,611, Cl. 260-326.800.
Sagaser, Thomas M.: *See—*
Bauer, James J.; Albright, Larry E.; Werner, James L.; Sagaser, Thomas M.; and Hoechst, Lonnie D., 4,131,225, Cl. 228-161.000.
Saggio, Anthony S.: *See—*
Bode, Charles H., Jr.; Saggio, Anthony S.; Wagner, George J., Jr.; and Wessel, Richard L., 4,131,220, Cl. 222-607.000.
Saiki, Noritsugu: *See—*
Nakamura, Yoshitsugu; Kawamura, Takeo; Saiki, Noritsugu; and Tokashiki, Michiyuki, 4,131,594, Cl. 260-40.00R.
Saita, Hiroshi: *See—*
Kimura, Shinji; Godai, Tomokazu; Minato, Shoji; Kobayashi, Minoru; Yamaga, Makoto; Maki, Shingo; Hashimoto, Yoshizo; Suga, Tetsuo; and Saita, Hiroshi, 4,131,784, Cl. 219-137.0WM.
Saito, Hisao: *See—*
Nakai, Kaichiro; and Saito, Hisao, 4,131,824, Cl. 315-39.510.
Saito, Yuichi; Iijima, Masayuki; and Mayama, Osamu, to Mitsubishi Kinzoku Kabushiki Kaisha. Process for manufacturing cobalt-base reduced powder. 4,131,450, Cl. 75-0.5BA.
Sakaguchi, Hirokazu: *See—*
Nishikawa, Shigeyoshi; Muroshima, Takashi; Sakaguchi, Hirokazu; Hasebe, Morihiko; Katagiri, Katsuji; and Inoue, Kazuo, 4,131,931, Cl. 361-315.000.
Sakaguchi, Shinji: *See—*
Miyazako, Takushi; Sakaguchi, Shinji; Hanai, Sosuke; and Karino, Yukio, 4,131,469, Cl. 96-77.000.
Sakai, Kohzo: *See—*
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Sakata, Shinichi: *See—*
Araki, Masakatsu; Ochi, Shuhei; Kusunoki, Toshio; Ishii, Teizi; and Sakata, Shinichi, 4,131,121, Cl. 132-7.000.
Sakurai, Osamu: *See—*
Tatsukawa, Osami; Sakurai, Osamu; and Serizawa, Hisayuki, 4,131,779, Cl. 219-10.55R.
Sandegren, Owe, to Landstingens Inkopscentral, L I C. Device for emptying a container. 4,131,217, Cl. 222-82.000.
Sanders, James M.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,131,687, Cl. 426-3.000.
Sandoz, Inc.: *See—*
Nadelson, Jeffrey, 4,131,679, Cl. 424-263.000.
Sanford, Gary G.: *See—*
Munson, Robert E.; Sanford, Gary G.; and Murphy, Lawrence R., 4,131,892, Cl. 343-700.0MS.
Munson, Robert E.; and Sanford, Gary G., 4,131,893, Cl. 343-700.0MS.
Sankyo Company, Limited: *See—*
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,131,599, Cl. 260-45.80N.
Sanmeidenki Kabushikikaisha: *See—*
Nonoyama, Tikahiro, 4,131,719, Cl. 428-598.000.
Sanuki, Tetsuo: *See—*
Kako, Yuji; Kiguga, Toyoji; and Sanuki, Tetsuo, 4,131,582, Cl. 260-29.300.
Sanyo Electric Co., Ltd.: *See—*
Houshi, Teruo, 4,131,828, Cl. 318-138.000.
Sasaki, Minoru; Ito, Kaoru; Minamida, Katsuhiro; and Fujita, Keiki, to Nippon Steel Corporation. Iron ore pellet process control. 4,131,668, Cl. 264-40.400.
Sasson, Steven J.: *See—*
Lloyd, Gareth A.; and Sasson, Steven J., 4,131,919, Cl. 360-9.000.
Sato, Isao; Uchiyama, Yoshihiro; Ishibashi, Youji; Tsukahara, Satoshi; Oshima, Ryoichiro; and Hishinuma, Yukio, to Hitachi, Ltd. Apparatus for the treatment of gas turbine exhaust gas. 4,131,432, Cl. 422-177.000.
Sato, Katsuya: *See—*
Yoshida, Masashi; Iino, Yasuo; and Sato, Katsuya, 4,131,922, Cl. 360-90.000.
Sato, Yasuhito; Tanaka, Minoru; and Nakamura, Akihisa, to Honda Giken Kogyo Kabushiki Kaisha. Flame guide channel for internal combustion engine. 4,131,092, Cl. 123-32.0ST.
Satoh, Mitsunori; Hijikata, Masayuki; Maeda, Hiroshi; and Morimoto, Ichiro, to National Research Institute for Metals. Electrical contact material of silver base alloy. 4,131,458, Cl. 75-173.00R.
Sattelmeyer, Richard: *See—*
Schunck, Erich; Schmelzer, Heinz; and Sattelmeyer, Richard, 4,131,709, Cl. 428-261.000.
Saunders, David H., to British Hydromechanics Research Association, The. High velocity liquid jet cutting nozzle. 4,131,236, Cl. 239-589.000.
Saunders, John C.: *See—*
Evans, Delme; Saunders, John C.; and Williamson, William R. N., 4,131,682, Cl. 424-275.000.
Sauvage, Philippe: *See—*
Pflieger, Bernard; Sauvage, Philippe; and Tombrel, Francis, 4,131,151, Cl. 164-89.000.
Sawada, Daisaku; Goto, Kenji; Shigemaut, Takashi; Takeda, Yuji; Hattori, Tadashi; Yamaguchi, Hiroaki; and Nishida, Minoru, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Ignition system for internal combustion engines. 4,131,097, Cl. 123-117.00R.
Sawyer, Joseph J. Roller guard for swimming pool cleaning hoses. 4,131,136, Cl. 138-110.000.
Saxe, Robert L.: *See—*
Witte, Michael; Saxe, Robert L.; and Thompson, Robert I., 4,131,334, Cl. 350-147.000.
Schadlich, Gunther: *See—*
Moraw, Roland; and Schadlich, Gunther, 4,131,337, Cl. 350-3.860.
Schaefer, Frederick W.: *See—*
Melcher, Ronald E.; and Schaefer, Frederick W., 4,131,476, Cl. 106-38.350.
Schaffling, Otto G., to Olin Corporation. Process for preparing a rocket motor. 4,131,051, Cl. 86-1.00R.
Schall, Myron M., to Dana Corporation. Friction clutch synchronizer with resilient gear coupling. 4,131,185, Cl. 192-53.00B.
Schaner, Ferdinand: *See—*
Ludemann, Heinz; Fengler, Harald; and Schaner, Ferdinand, 4,131,041, Cl. 83-94.000.
Schegolev, Vladimir I.: *See—*
Muzhzhavlev, Konstantin D.; Yazev, Vladimir D.; Schegolev, Vladimir I.; Ivanov, Andrei B.; Vasiliev, Alexei V.; Romanenko, Oleg N.; Kosarev, Sergei P.; and Ovcharenko, Vladimir G., 4,131,522, Cl. 204-60.000.
Scheinman, Arnold H.; and Paisker, Erns: Automatic sheet-stacking and transport machine. 4,131,207, Cl. 214-6.0DK.
Scheithauer, Steffen: *See—*
Fischer, Gunther; Wenzel, Beate; Scheithauer, Steffen; Franz, Udo; Junge, Karl-Wilhelm; Schroter, Christof; Gahler, Siegfried; and Morgenstern, Johannes, 4,131,470, Cl. 96-107.000.
Scherrer, Igor; Berney, Jean-Claude; and Robert-Grandpierre, Jean-Claude, to Ebauches S.A. Electronic circuit for electronic watch. 4,130,988, Cl. 58-85.500.
Schiavone, Frank J., to Ball Corporation. High efficiency microstrip antenna structure. 4,131,894, Cl. 343-700.0MS.
Schickedanz, Willi. Timepiece. 4,130,987, Cl. 58-50.00R.
Schiminski, Herbert: *See—*
Dammann, Peter; Schippers, Heinz; Turk, Herbert; and Schiminski, Herbert, 4,130,983, Cl. 57-5.000.
Schippers, Heinz: *See—*
Dammann, Peter; Schippers, Heinz; Turk, Herbert; and Schiminski, Herbert, 4,130,983, Cl. 57-5.000.
Schirmer, Ulrich: *See—*
Koenig, Karl-Heinz; Schirmer, Ulrich; Wuerzer, Bruno; and Fett, Kurt, 4,131,751, Cl. 560-29.000.
Schlage Lock Company: *See—*
Rodseth, William G., 4,130,913, Cl. 16-49.000.
Schlossberg, Howard, to United States of America, Air Force. Fabry-Perot diplexer. 4,131,792, Cl. 250-199.000.
Schlumberger Technology Corporation: *See—*
Ingram, John D., 4,131,875, Cl. 340-15.5BH.
Schmelz, Helmut; and Schwaen, Werner, to Siemens Aktiengesellschaft. Capacitor dielectric with inner blocking layers and method for producing the same. 4,131,903, Cl. 357-10.000.
Schmelzer, Heinz: *See—*
Schunck, Erich; Schmelzer, Heinz; and Sattelmeyer, Richard, 4,131,709, Cl. 428-261.000.
Schmid, Markus, to Concast AG. Roller aprons for a multiple strand billet- or bloom casting installation containing more than two strands for the continuous casting of metals, especially steel. 4,131,153, Cl. 164-442.000.

Schmidt, Dennis L.: *See*—
Doorakian, George A.; Schmidt, Dennis L.; and Cornell, Martin C., III, 4,131,633, Cl. 260-837.00R.
Schmidt, Gunter, to Cubic Productron. Sheet film processor. 4,131,356, Cl. 354-322.000.
Schmidt, Jacob, deceased (by Schmidt, Mia H., administratrix), to United States of America, Navy. Circulation controlled rotor blade. 4,131,390, Cl. 416-20.00R.
Schmidt, John, Jr.; and Aryamane, Avinash, to Littelfuse, Inc. Plug-in fuse assembly construction. 4,131,869, Cl. 337-264.000.
Schmidt, Mia H., administratrix: *See*—
Schmidt, Jacob, deceased, 4,131,390, Cl. 416-20.00R.
Schmitt, Frederick L.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,131,687, Cl. 426-3.000.
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dietrich, to ESPE Fabrik Pharmazeutischer Praparate GmbH. Dental compositions comprising acrylic esters of tricyclo [5.2.1.0^{2,6}] decane polymers. 4,131,729, Cl. 526-282.000.
Schmitz, James E. Earth working apparatus. 4,131,162, Cl. 172-138.000.
Schmitz, Norbert L.: *See*—
Hucker, David J.; and Schmitz, Norbert L., 4,131,844, Cl. 323-45.000.
Schneider, Jon A.: *See*—
Black, Stanley H.; and Schneider, Jon A., 4,131,862, Cl. 331-4.000.
Schnell, Hans G., to Van Kooten B.V. Pile driving device. 4,131,166, Cl. 173-43.000.
Schollmeier, Gero, to Siemens Aktiengesellschaft. Switching circuit for regulating the repetition rate of clock pulses. 4,131,854, Cl. 328-63.000.
Schrage, Linus. Lens cap holder for cameras. 4,131,147, Cl. 150-52.00J.
Schriber, Louis; and Blaha, John F., to Harris Corporation. Rotary knife mounting. 4,131,047, Cl. 83-698.000.
Schroter, Christof: *See*—
Fischer, Gunther; Wenzel, Beate; Scheithauer, Steffen; Franz, Udo; Junge, Karl-Wilhelm; Schroter, Christof; Gahler, Siegfried; and Morgenstern, Johannes, 4,131,470, Cl. 96-107.000.
Schumacher, Gunter: *See*—
Schumacher, Gustav, II; and Schumacher, Gunter, 4,130,981, Cl. 56-208.000.
Schumacher, Gustav, II; and Schumacher, Gunter. Control system and method for combine harvesters. 4,130,981, Cl. 56-208.000.
Schunck, Erich; Schmelzer, Heinz; and Sattelmeyer, Richard, to Hoechst Aktiengesellschaft. Adhesive compositions. 4,131,709, Cl. 428-261.000.
Schuster, Samuel R.: *See*—
Kopito, Louis; Schuster, Samuel R.; and Kosasky, Harold, 4,131,112, Cl. 128-2.00B.
Schwaen, Werner: *See*—
Schmelz, Helmut; and Schwaen, Werner, 4,131,903, Cl. 357-10.000.
Schweikle, George E.: *See*—
Brumfield, Walter T., Jr.; Newsome, Norman M.; and Schweikle, George E., 4,131,932, Cl. 361-356.000.
SCM Corporation: *See*—
Porterfield, Richard F., 4,131,374, Cl. 400-232.000.
Scott, James F., to Perolin Company, Inc., The. Fuel additives, additive compositions and methods of employing same to prevent corrosion of metal surfaces in contact with hot gaseous combustion products. 4,131,433, Cl. 44-51.000.
Scott Paper Company: *See*—
Gotchel, Joel P.; and Norton, Henry J., 4,130,915, Cl. 19-304.000.
Worrell, Robert A., Sr., 4,131,195, Cl. 206-205.000.
Scott, Ronald K., to Caterpillar Tractor Co. Dynamic timing indicating apparatus. 4,131,014, Cl. 73-119.00A.
Scovill Manufacturing Company: *See*—
Aureli, William D., 4,131,223, Cl. 225-94.000.
Seebacher, Baerbel, to Siemens Aktiengesellschaft. Method for making ceramic electric resistor. 4,131,692, Cl. 427-101.000.
Segerstrom, Lars, to Aktiebolaget Imo-Industri. Hydraulic rotary screw machine with axial balancing piston. 4,131,400, Cl. 418-203.000.
Schulster, Joseph P.; Halbach, Stephen N.; Haar, Darrell; and Crawford, Theron L. Machine for making dry cast concrete pipe. 4,131,408, Cl. 425-410.000.
Seidel, Sigurd, to Skischuhfabrik Dynafit Gesellschaft. Fastening means for sports shoes. 4,130,949, Cl. 36-50.000.
Seitzer, Walter H.: *See*—
Chong, Victor M.; and Seitzer, Walter H., 4,131,514, Cl. 204-129.000.
Seiz, Carl G.: *See*—
Jacoby, Peter H.; and Seiz, Carl G., 4,131,204, Cl. 211-192.000.
Seiz Corporation: *See*—
Jacoby, Peter H.; and Seiz, Carl G., 4,131,204, Cl. 211-192.000.
Selecontrol S.A.S.: *See*—
Malatto, Renzo, 4,131,008, Cl. 72-389.000.
Serizawa, Hisayuki: *See*—
Tatsukawa, Osami; Sakurai, Osamu; and Serizawa, Hisayuki, 4,131,779, Cl. 219-10.55R.
Setter, Gerald A., Jr.: *See*—
Caruso, Robert D.; and Setter, Gerald A., Jr., 4,131,484, Cl. 134-1.000.
Shabalina, Roza I.: *See*—
Lakernik, Mark M.; Shabalina, Roza I.; Gavrilenko, Alexandr F.; Yakovenko, Anatoly A.; Golovachev, Anatoly I.; and Egorova, Tatyana S., 4,131,451, Cl. 75-14.000.
Shackle, Peter W.: *See*—
Hartman, Adrian R.; North, James C.; Reutlinger, George W.; and Shackle, Peter W., 4,131,910, Cl. 357-49.000.
Shah, Dinesh O.; and Sibley, Murray J., to Barnes-Hind Pharmaceuticals, Inc. Treatment of dry eye. 4,131,651, Cl. 424-78.000.
Shahryar, Ishaq M.: *See*—
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Shamah, Eliahu: *See*—
Thompson, Jerry L.; Deluga, Sigmund S.; Harnach, James W.; and Shamah, Eliahu, 4,131,551, Cl. 252-33.000.
Sharma, Lakshmi P.; and Kurtz, Bruce E., to Allied Chemical Corporation. Process for producing bromine. 4,131,626, Cl. 260-658.00R.
Sharp Kabushiki Kaisha: *See*—
Kuzumoto, Takatoshi; Kumata, Kiyoshi; and Yamamoto, Keizo, 4,131,864, Cl. 331-116.00R.
Shaw, John T.: *See*—
Isherwood, Harold; and Shaw, John T., 4,131,574, Cl. 260-17.300.
Shea, Vincent; and Wojcik, Walter J., to International Business Machines Corporation. Pellicle cover for projection printing system. 4,131,363, Cl. 355-75.000.
Shell Oil Company: *See*—
Entwistle, Ian D., 4,131,449, Cl. 71-98.000.
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., to Merck & Co., Inc. Anti-inflammatory oxazolo [5,4-b]pyridines. 4,131,677, Cl. 424-256.000.
Sheppard, Stewart A.; Arbib, Philip B.; and Pert, Maurice R., to Bib Hi-Fi Accessories Limited. Tape head cleaning device. 4,130,912, Cl. 15-210.00R.
Sherrington, Paul R.: *See*—
Bailey, John; Randell, Michael J.; and Sherrington, Paul R., 4,131,558, Cl. 252-135.000.
Shiga, Kazuyuki: *See*—
Komori, Masakazu; Shiga, Kazuyuki; Kitazato, Hajime; Okajima, Hiroaki; Tanaka, Yoshiharu; Nojima, Shoiti; Fukamachi, Masashige; and Kurima, Akinori, 4,131,565, Cl. 252-417.000.
Shigemaut, Takashi: *See*—
Sawada, Daisaku; Goto, Kenji; Shigemaut, Takashi; Takeda, Yuji; Hattori, Tadashi; Yamaguchi, Hiroaki; and Nishida, Minoru, 4,131,097, Cl. 123-117.00R.
Shimakura, Mamoru: *See*—
Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.
Shimano Industrial Company Limited: *See*—
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Shimasaki, Katsunori: *See*—
Utsunomiya, Kei; Soga, Kazuya; Shimasaki, Katsunori; Mito, Yutaka; Oaki, Mamoru; Haseba, Shigeru; Miki, Hiroetu; and Masaki, Michiko, 4,131,643, Cl. 423-239.000.
Shinagawa, Shinichi: *See*—
Tsuchiya, Takuichi; and Shinagawa, Shinichi, 4,131,927, Cl. 361-6.000.
Shinohara, Hironobu: *See*—
Yoshida, Yoshinori; Kobayashi, Tutomu; Shinohara, Hironobu; and Hanari, Izumi, 4,131,743, Cl. 560-244.000.
Shiraogawa, Yukio, to Tokyo Shibaura Electric Co., Ltd. Microprogrammed computer employing a decode read only memory (DROM) and a microinstruction read only memory (ROM). 4,131,943, Cl. 364-200.000.
Shoberg, Robert D., to Photonic Systems, Inc. High speed movie camera. 4,131,343, Cl. 352-84.000.
Shoe and Allied Trades Research Association, The: *See*—
Pettit, Donald; and Abbott, Stephen G., 4,131,918, Cl. 360-1.000.
Shoei Electric Co., Ltd.: *See*—
Kohga, Masayuki; and Ishii, Katsuto, 4,131,847, Cl. 324-141.000.
Shoffner, James E.: *See*—
Moores, Peter R.; and Shoffner, James E., 4,131,708, Cl. 428-257.000.
Shopalovich, Predrag, to United States of America, Army. Flexible slide fastener. 4,130,917, Cl. 205.1 R-.
Shosuke Okamoto: *See*—
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,131,673, Cl. 424-247.000.
Shurboff, John D.: *See*—
Karkoski, Joseph; Payette, Lionel J.; and Shurboff, John D., 4,131,714, Cl. 428-379.000.
Shuster, Edward J.: *See*—
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,131,687, Cl. 426-3.000.
Shutt, James R., to Electro-Therm, Inc. Electrically heated liquid tank employing heat pipe heat transfer means. 4,131,785, Cl. 219-326.000.
Shy, Min-Ching. Folding means for supporting legs of roaster oven with high stability. 4,131,261, Cl. 248-439.000.
Siarto, Andrew V., to Siorto Machine & Tool Co., Inc. Machine tool. 4,130,920, Cl. 29-38.00R.
Sibley, Murray J.: *See*—
Shah, Dinesh O.; and Sibley, Murray J., 4,131,651, Cl. 424-78.000.
Sick, Erwin; Walter, Arthur; and Fetzer, Gunter, to Erwin Sick Gesellschaft m.b.H. Optik-Elektronik. Electrooptical scanning device. 4,131,804, Cl. 250-566.000.
Siegel, Harvey L.; Muething, Gerald F., Jr.; and Radkowski, Edward J., to Itek Corporation. Linked microprogrammed plural processor system. 4,131,941, Cl. 364-200.000.

Siegfried Aktiengesellschaft: *See—*
Zirngibl, Ludwig; Fischer, Johanna; and Thiele, Kurt, 4,131,608, Cl. 260-307.00D.
Siemens Aktiengesellschaft: *See—*
Aulich, Hubert; and Grabmaier, Josef, 4,131,447, Cl. 65-325.000.
Becker, Harry; Doerflinger, Karl; Ey, Klaus; Reiter, Georg; Rutzmoser, Hermann; and Theus, Richard, 4,131,934, Cl. 361-428.000.
Dannhauser, Friedrich; and Porst, Alfred, 4,131,339, Cl. 357-13.000.
Franke, Kurt, 4,131,797, Cl. 250-322.000.
Hohne, Karl, 4,131,570, Cl. 252-473.000.
Ihlein, Walter; Kleeberg, Wolfgang; Markert, Helmuth; and Mertens, Willi, 4,131,600, Cl. 528-53.000.
Kirschner, Nikolaus, 4,131,806, Cl. 307-215.000.
Knauer, Karl; and Pfleiderer, Hans-Joerg, 4,131,810, Cl. 307-311.000.
Lange, Heinrich, 4,131,835, Cl. 318-562.000.
Michel, Alfred; Henkel, Hans-Joachim; Koch, Christian; and Kostka, Hana, 4,131,569, Cl. 252-462.000.
Schmelz, Helmut; and Schwaen, Werner, 4,131,903, Cl. 357-10.000.
Schollmeier, Gero, 4,131,854, Cl. 328-63.000.
Seebacher, Baerbel, 4,131,692, Cl. 427-101.000.
Wachs, Walter; and Stickel, Heinz, 4,131,923, Cl. 360-106.000.
Wiesner, Wolfgang, 4,131,840, Cl. 318-685.000.
Windele, Josef, 4,131,358, Cl. 355-3.0TR.
Signorini, Ernesto: *See—*
Gozzo, Franco; Masoero, Marcella; Signorini, Ernesto; and Fabbrini, Riccardo, 4,131,621, Cl. 260-551.00C.
Sika, Zigurd K.: *See—*
Apsit, Voldemar V.; Sika, Zigurd K.; and Kurkalov, Ivan I., 4,131,811, Cl. 310-12.000.
Silverman, Avrum. False color photographic element and process. 4,131,464, Cl. 96-22.000.
Silvers, Harold N.: *See—*
Lai, Kwo-Hrong; and Silvers, Harold N., 4,131,731, Cl. 528-370.000.
Silvestrini, Bruno, to Aziende Chimiche Riunite Angelini Francesco A.C.R.A.F. S.p.A. Use of combinations of L-DOPA with trazodone and L-DOPA with etoperidone in Parkinsonism. 4,131,675, Cl. 424-250.000.
Simpson, George H.: *See—*
Ball, George A., Jr.; and Simpson, George H., 4,131,657, Cl. 261-39.00E.
Dombrowski, Joseph A.; Baxter, Clement T.; Howard, Frederick B.; and Simpson, George H., 4,131,868, Cl. 337-113.000.
Singer Company, The: *See—*
Bayley, Donald S., 4,131,443, Cl. 65-17.000.
Carollo, Jerome T., 4,131,345, Cl. 352-132.000.
Johnson, Ralph E., 4,131,076, Cl. 112-210.000.
Stavis, Gus, 4,131,891, Cl. 343-112.00S.
Wurst, John W., 4,131,075, Cl. 112-158.00E.
Sinn, Gustav: *See—*
Perrey, Hermann; Matner, Martin; and Sinn, Gustav, 4,131,603, Cl. 528-45.000.
Siorto Machine & Tool Co., Inc.: *See—*
Siarto, Andrew V., 4,130,920, Cl. 29-38.00R.
Siposs, George G. Blood shut-off valve. 4,131,431, Cl. 422-45.000.
Sirtl, Erhard: *See—*
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,131,659, Cl. 264-25.000.
Siy, Pepe; and Brown, Joseph R., to Burroughs Corporation. Signature verification pen. 4,131,880, Cl. 340-146.3SY.
Sjoblom, Bror A. Method for transport of manure and a device according to the method. 4,131,394, Cl. 417-481.000.
Skahill, Fred J., to United States of America, Army. Drum cam with anti hang-fire feature. 4,131,052, Cl. 89-11.000.
Skeen, Lawrence, to Bauer Bros. Co., The. System and apparatus for milling corn starch and like raw materials. 4,131,061, Cl. 99-521.000.
Skischuhfabrik Dynafit Gesellschaft: *See—*
Seidel, Sigurd, 4,130,949, Cl. 36-50.000.
Skyline Corporation: *See—*
Werner, Michael F., 4,131,301, Cl. 280-789.000.
Slama, Georges S.: *See—*
Randon, Jean-Louis R. G.; and Slama, Georges S., 4,131,697, Cl. 427-249.000.
Slawny, Howard J., to Paper Converting Machine Company. Method and apparatus for interfolding. 4,131,271, Cl. 270-40.000.
Smirnov, Anatoly G.: *See—*
Minachev, Khabib M.; Mortikov, Evgeny S.; Leontiev, Alexandr S.; Smirnov, Anatoly G.; Kononov, Nikolai F.; Masloboev-Shvedov, Alexei A.; Zhomov, Alexandr K.; and Kholdyakov, Nikolai I., 4,131,750, Cl. 568-901.000.
Smith, Alfred H., Jr., to General Electric Company. Low vapor transmission rate silicone composition. 4,131,588, Cl. 260-37.0SB.
Smith, Alfred H., Jr., to General Electric Company. Low temperature transmission room temperature vulcanizable silicone compositions. 4,131,589, Cl. 260-37.0SB.
Smith, Edric R., to Smiths Industries Limited. Sensor-assemblies for engines. 4,131,756, Cl. 136-230.000.
Smith, Grant H.; and Carlson, Ronald L., to Borg-Warner Corporation. Friction clutch apparatus. 4,131,187, Cl. 192-99.00A.
Smith, Herman W., to Upjohn Company, The. 6-Hydroxy-PGE_1 compounds. 4,131,738, Cl. 560-121.000.
Smith, James. Automatic spring-powered battery charging device. 4,131,842, Cl. 320-61.000.
Smith, Leslie H., to Imperial Chemical Industries Limited. Pharmaceutical compositions and uses of alkanolamine derivatives. 4,131,685, Cl. 424-322.000.
Smith, Paul L.: *See—*
Walker, Basil E.; Pohanka, Robert C.; Smith, Paul L.; and Rice, Roy W., 4,131,444, Cl. 65-32.000.
SmithKline Corporation: *See—*
Gleason, John G., 4,131,734, Cl. 544-26.000.
Hill, David T.; Sutton, Blaine M.; and Lantos, Ivan, 4,131,732, Cl. 536-121.000.
Smiths Industries Limited: *See—*
Smith, Edric R., 4,131,756, Cl. 136-230.000.
Snow, Herman I. Folding grapple for traps. 4,130,961, Cl. 43-96.000.
Societa Farmaceutici Italia S.p.A.: *See—*
Penco, Sergio; Angelucci, Francesco; and Arcamone, Federico, 4,131,649, Cl. 424-180.000.
Societe Anonyme D.B.A.: *See—*
Tanguy, Christian, 4,131,125, Cl. 137-118.000.
Societe Anonyme Dite: Les Cables de Lyon: *See—*
Dubost, Rene; Gauthier, Francis; and Mignien, Georges, 4,131,404, Cl. 425-129.00R.
Societe d'Etudes de Produits Chimiques: *See—*
Esanu, Andre, 4,131,617, Cl. 260-465.00D.
Societe dite: Gatrun Anstalt: *See—*
Corbic, Yves J., 4,131,211, Cl. 215-2.000.
Societe Generale de Constructions Electriques et Mecaniques "Alsthom et Cie": *See—*
Chillier-Duchatel, Nicole; and Verger, Bernard, 4,131,532, Cl. 204-256.000.
Soga, Kazuya: *See—*
Utsunomiya, Kei; Soga, Kazuya; Shimasaki, Katsunori; Mito, Yutaka; Oaki, Mamoru; Haseba, Shigeru; Miki, Hiroetu; and Masaki, Michiko, 4,131,643, Cl. 423-239.000.
Sokol, Florence L.: *See—*
Sokol, John J.; and Sokol, Florence L., 4,131,083, Cl. 119-51.500.
Sokol, John J.; and Sokol, Florence L. Bird unit. 4,131,083, Cl. 119-51.500.
Sokoly, John; and Roberts, Kenneth N., to Essex Group, Inc. Door lock actuator with override mechanism. 4,131,306, Cl. 292-201.000.
Solai Vignola di Fabiani Orlando e C.-Societa in nome collettivo: *See—*
Abate, Giorgio, 4,131,670, Cl. 264-256.000.
Solec International, Inc.: *See—*
Della-Vedowa, Richard P.; and Shahryar, Ishaq M., 4,131,123, Cl. 136-89.00P.
Sollars, Herbert M. Animal feeding equipment. 4,131,082, Cl. 119-51.500.
Solon Manufacturing Company, The: *See—*
Holmes, Peter C., 4,131,050, Cl. 85-62.000.
SOLVAY & Cie.: *See—*
Bodson, Luc; Obsomer, Marc; and Michel, Edmond, 4,131,665, Cl. 264-572.000.
Soma, Nobuo: *See—*
Brunetti, Heimo; Rody, Jean; Soma, Nobuo; and Kurumada, Tomoyuki, 4,131,599, Cl. 260-45.80N.
Somar Manufacturing Co., Ltd.: *See—*
Nomura, Masahiro; and Hirabayashi, Yutaka, 4,131,466, Cl. 96-49.000.
Sony Corporation: *See—*
Hirai, Jun, 4,131,912, Cl. 358-4.000.
Hirano, Takayasu; Hisagen, Yoshiaki; Takamizawa, Minoru; and Yoshioka, Hiroshi, 4,131,717, Cl. 428-447.000.
Machida, Tetsuo, 4,131,243, Cl. 242-199.000.
Ninomiya, Takeshi, 4,131,885, Cl. 340-347.0AD.
Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, 4,131,913, Cl. 358-44.000.
Spar Aerospace Producs Ltd.: *See—*
English, Christopher D., 4,131,812, Cl. 310-13.000.
Spector, George: *See—*
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Spectrum X-Ray Corporation: *See—*
Hogan, William F., 4,131,801, Cl. 250-439.00R.
Speed-Saw, Inc.: *See—*
Mayo, George L., 4,131,143, Cl. 144-30.000.
Speer, Thomas L.: *See—*
Watson, George H.; and Speer, Thomas L., 4,131,416, Cl. 299-2.000.
Spengler, Heinz, to G. Rau. Heavy-duty heat-responsive bimetallic material. 4,131,720, Cl. 428-619.000.
Sperry, Peter R.: *See—*
Emmons, William D.; Nyi, Kayson; and Sperry, Peter R., 4,131,580, Cl. 260-29.6RW.
Sperry Rand Corporation: *See—*
Black, Stanley H.; and Schneider, Jon A., 4,131,862, Cl. 331-4.000.
Fletcher, Steven J.; Wright, Jeffrey L.; and Davis, Richard S., 4,131,949, Cl. 364-900.000.
Ruby, Joseph H., 4,131,130, Cl. 137-596.170.
Spielau, Paul: *See—*
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Spinner, Ulrich: *See—*
Menth, Anton; Nagel, Hartmut; and Spinner, Ulrich, 4,131,495, Cl. 148-31.570.
Spitz, Edward K.; and Cox, Lawton E., to Raybestos-Manhattan, Inc. Waste asbestos recovery from production of asbestos products. 4,131,661, Cl. 264-38.000.

Sprague Electric Company: *See—*
Bernard, Walter J.; and Szpak, Stanley P., 4,131,520, Cl. 204-42.000.
Clement, Warren J., 4,131,935, Cl. 361-433.000.

Sprauer, Jerome W., to Du Pont de Nemours, E. I., and Company. Process for preparing polyamide from diacid-rich component and diamine-rich component. 4,131,712, Cl. 528-335.000.

Spring, Peter: *See—*
Einstein, Bernard C.; and Spring, Peter, 4,131,782, Cl. 219-121.0LM.

Springer, Barry R. System for multistation remote position indication and control. 4,131,839, Cl. 318-675.000.

Square D Company: *See—*
Brumfield, Walter T., Jr.; Newsome, Norman M.; and Schweikle, George E., 4,131,932, Cl. 361-356.000.
Ehrenberger, Frank T., 4,131,776, Cl. 200-158.000.

Stamicarbon, B.V.: *See—*
Paulen, Hendrikus J. G., 4,131,634, Cl. 260-845.000.

Standard Oil Company: *See—*
Hardman, Harley F., 4,131,631, Cl. 260-683.300.
Thompson, Jerry L.; Deluga, Sigmund S.; Harnach, James W.; and Shamah, Eliahu, 4,131,551, Cl. 252-33.000.

Standard Oil Company (Indiana): *See—*
Osborne, Bodwell D., 4,130,995, Cl. 405-224.000.
Watson, George H.; and Speer, Thomas L., 4,131,416, Cl. 299-2.000.
West, C. Thomas, 4,131,553, Cl. 252-33.000.

Stanley-Mabo S.A.: *See—*
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Statni vyzkumny ustav materialu: *See—*
Kupf, Lubomir; and Kos, Vladimir, 4,131,411, Cl. 425-559.000.

Staton, Marshall J.: *See—*
Bazzle, Lillian M.; and Staton, Marshall J., 4,130,950, Cl. 36-127.000.

Stauffer Chemical Company: *See—*
Jacobs, Barry A., 4,131,660, Cl. 264-26.000.

Stavis, Gus, to Singer Company, The. Passive microwave velocity sensor. 4,131,891, Cl. 343-112.00S.

Steag Kernenergie G.m.b.H.: *See—*
Bahr, Werner; Drobnik, Stefan; Hild, Werner; Kroebel, Reinhard; Meyer, Alfred; and Naumann, Gunter, 4,131,563, Cl. 252-301.10W.

Steckel, Thomas F., to Lubrizol Corporation, The. Overbased bridged phenol metal salt/halo carboxylic acid condensate additives for lubricants. 4,131,554, Cl. 252-33.600.

Steigerwald, Conrad J.: *See—*
Rich, Dennis E.; and Steigerwald, Conrad J., 4,131,042, Cl. 83-100.000.

Stein, Marc T.: *See—*
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Steiner American Corporation: *See—*
Cassia, Antonio M., 4,131,044, Cl. 83-205.000.

Steiner, Edward L.: *See—*
Gillett, Kenneth; Steiner, Edward L.; Fiske, Kenton W.; Davis, Kenneth A.; Kukucka, William P.; Criswell, Thomas; and Richardson, Philip, 4,131,942, Cl. 364-200.000.
Richardson, Philip; Steiner, Edward L.; Daughton, John W.; Fiske, Kenton W.; and Criswell, Thomas, 4,131,945, Cl. 364-200.000.

Steiniger, Wolfgang: *See—*
Bottcher, Hubert; Pfannmuller, Joachim; Kaebernick, Hartmut; Steiniger, Wolfgang; and Preuss, Horst-Dieter, 4,131,501, Cl. 156-157.000.

Stephanoff, Nicholas N., to Energy Processing and Equipment Co. Fluid energy mill for large particulate materials. 4,131,239, Cl. 241-39.000.

Stephens, Daniel R. Safety apparatus for operating clutch actuated, movable ram machines. 4,131,189, Cl. 192-129.00B.

Stephens, James B.: *See—*
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Sterling, Maurice, to Eby Company. Stacking cable clamp. 4,131,257, Cl. 248-67.500.

Sterndent Corporation: *See—*
French, Park; and Conaway, William H., 4,131,367, Cl. 356-405.000.

Stewart, John A.; and Nichols, Wayne C., to General Motors Corporation. Low tire pressure indicator circuit. 4,131,877, Cl. 340-58.000.

Stickel, Heinz: *See—*
Wachs, Walter; and Stickel, Heinz, 4,131,923, Cl. 360-106.000.

Stieber, Volker A. W., to Applied Radiation Corporation. Ionization chamber. 4,131,799, Cl. 250-385.000.

Stiles, Alvin B., to Du Pont de Nemours, E. I., and Company. Methanation catalyst. 4,131,616, Cl. 260-449.60M.

Stone, Dennis C., to Dynascan Corporation. Meter control circuit. 4,131,846. Cl. 324-132.000.

Stora Kopparbergs Bergslags AB: *See—*
Collin, Per H., 4,131,452, Cl. 75-60.000.

Stork, Gilbert J.: *See—*
Untch, Karl G.; and Stork, Gilbert J., 4,131,746, Cl. 560-255.000.

Stoutmeyer, Ronald G.; and Alltop, William O., to United States of America, Navy. Lateral photodetectors. 4,131,793, Cl. 250-211.00J.

Strader, Don S., to Motor Wheel Corporation. Self-damping trailer hitch. 4,131,296, Cl. 280-485.000.

Street, Anthony C.: *See—*
Lloyd, Robert G.; Street, Anthony C.; and Golden, Donald M. G. R., deceased, 4,131,251, Cl. 244-137.00R.

Strohmeyer, Willi. Apparatus for severing a web. 4,131,046, Cl. 83-471.200.

Stubben GmbH, Riding Equipment: *See—*
Bischeltsrieder, Lorenz, 4,130,979, Cl. 54-44.000.

Stupay, Lawrence J., to Bunker Ramo Corporation. Mounting device for electrical connectors. 4,131,330, Cl. 339-125.00R.

Styblo, Donald J.: *See—*
Braden, Arthur B.; McBride, Thomas R.; Styblo, Donald J.; Taylor, Samuel K.; and Richey, Joseph B., 4,131,802, Cl. 250-445.00T.

Sue, Takaji, to Ricoh Company, Ltd. Sheet feed cassette. 4,131,274, Cl. 271-9.000.

Suga, Tetsuo: *See—*
Kimura, Shinji; Godai, Tomokazu; Minato, Shoji; Kobayashi, Minoru; Yamaga, Makoto; Maki, Shingo; Hashimoto, Yoshizo; Suga, Tetsuo; and Saita, Hiroshi, 4,131,784, Cl. 219-137.0WM.

Sugalski, Raymond K., to General Electric Company. Non-fouling resealable vent. 4,131,722, Cl. 429-55.000.

Sugawara, Toru: *See—*
Amano, Matsuo; Kobori, Sigeyuki; and Sugawara, Toru, 4,131,930, Cl. 361-211.000.

Sugiura, Katsumi: *See—*
Etoh, Kunihiko; and Sugiura, Katsumi, 4,131,838, Cl. 318-603.000.

Sult, Gratz M. Refrigeration system and evaporator unit therefor. 4,130,996, Cl. 62-113.000.

Sumitomo Chemical Company, Limited: *See—*
Iwahashi, Shunji; Yamasaki, Masahiro; and Fujita, Takanori, 4,131,483, Cl. 134-1.000.

Sumitomo Durez Company, Ltd.: *See—*
Kako, Yuji; Kiguga, Toyoji; and Sanuki, Tetsuo, 4,131,582, Cl. 260-29.300.

Sumitomo Metal Industries, Ltd.: *See—*
Ito, Yoshinori; and Nakanishi, Mutsuo, 4,131,781, Cl. 219-73.000.

Sumitomo, Yasusuke: *See—*
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Sun Oil Company of Pennsylvania: *See—*
Chong, Victor M.; and Seitzer, Walter H., 4,131,514, Cl. 204-129.000.
Hansel, William B., 4,131,215, Cl. 222-26.000.

Sunde, Paul B. Seismic safety cutoff device. 4,131,124, Cl. 137-45.000.

Sundeen, Joseph E.; and Hauck, Frederic P., to E. R. Squibb & Sons, Inc. 4,5-Disubstituted-1-aminoalkyl cyclohexenes. 4,131,744, Cl. 560-252.000.

Sundstrand Corporation: *See—*
Hucker, David J.; and Schmitz, Norbert L., 4,131,844, Cl. 323-45.000.
Mabe, William J., Jr., 4,131,386, Cl. 415-98.000.
Privon, George T.; and Paczuski, Andrew W., 4,131,396, Cl. 417-372.000.

Sundstrand Data Control, Inc.: *See—*
Hugli, Hans W.; and Kubler, John M., 4,131,020, Cl. 73-517.00B.

Sunworks, Inc.: *See—*
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Surface Activation Corporation: *See—*
Morley, John R.; and Howe, Ralph E., 4,131,691, Cl. 427-41.000.

Sutton, Blaine M.: *See—*
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Suzuki, Ryoichi: *See—*
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Kawana, Hiroyoshi; Ono, Yusuke; and Matsuda, Mutsuhide, 4,131,350, Cl. 354-31.000.

Suzuki, Shuichi; and Wada, Moriyasu, to Tokyo Shibaura Electric Co., Ltd. Heat-resistant resin compositions. 4,131,632, Cl. 260-834.000.

Suzuki, Yoshiaki: *See—*
Tsuboi, Masayoshi; Suzuki, Yoshiaki; and Tabei, Masatoshi, 4,131,463, Cl. 96-1.00E.

Suzuki, Yuji: *See—*
Tsujimoto, Minoru; Okada, Minoru; Suzuki, Yuji; and Hirai, Toshihiro, 4,131,528, Cl. 204-157.10R.

Svec, Paul S., to General Electric Company. Fabrication of shell investment molds. 4,131,475, Cl. 106-38.300.

Swanson, Ron E.: *See—*
Husome, Robert G.; Fleming, Ron J.; and Swanson, Ron E., 4,131,540, Cl. 209-582.000.

Swech, Melvin J. Front ski attachment for motor bike. 4,131,292, Cl. 280-14.000.

Swift, Graham: *See—*
Emmons, William D.; and Swift, Graham, 4,131,736, Cl. 560-14.000.

Switchcraft, Inc.: *See—*
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Sybron Corporation: *See—*
Feigin, Robert, 4,131,585, Cl. 260-29.6MQ.

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Syntex (USA) Inc.: *See—*
Untch, Karl G.; and Stork, Gilbert J., 4,131,746, Cl. 560-255.000.

Szpak, Stanley P.: *See—*
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Szycher, Michael, to Thermo Electron Corporation. Polyurethane elastomer for heart assist devices. 4,131,604, Cl. 528-79.000.

Tabei, Masatoshi: *See—*
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Takahara, Toshiyuki: *See—*
Ono, Koichi; Takahara, Toshiyuki; and Ito, Tetsuyoshi, 4,131,299, Cl. 280-736.000.
Takahashi, Shigeo: *See—*
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Takashima, Toshiyuki, to Fujisawa Pharmaceutical Co., Ltd. Antiallergic method. 4,131,681, Cl. 424-267.000.
Takayama, Katsuki; and Ando, Masamoto, to Aisin Seiki Kabushiki Kaisha. Anti-skid brake control apparatus. 4,131,326, Cl. 303-115.000.
Takeda, Yuji: *See—*
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Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, to Toyo Boseki Kabushiki Kaisha; and Kasuga Denki Co., Ltd. Apparatus for detecting defects in sheet material. 4,131,803, Cl. 250-563.000.
Takenouchi, Matsuo, to Fuji Xerox Co., Ltd. Instant radiation image display element. 4,131,795, Cl. 250-315.00A.
Takeuchi, Kunio: *See—*
Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.
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Talbot, Claude J. Extension level. 4,130,943, Cl. 33-374.000.
Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,131,673, Cl. 424-247.000.
Tamura, Yoshihiro; and Togashi, Takeshi. Magazine vending machine. 4,131,213, Cl. 221-14.000.
Tanabe, Hisao, to Tokico Ltd. Gas filling method for gas spring. 4,131,139, Cl. 141-4.000.
Tanabe Seiyaku Co., Ltd.: *See—*
Ikezaki, Muneyoshi; Okazaki, Yashushi; Ito, Nobuo; Hoshiyama, Masao; Nagao, Taku; and Nakajima, Hiromichi, 4,131,686, Cl. 424-330.000.
Tanaka, Junzo; and Kai, Toshio, to Matsushita Electric Industrial Co., Ltd. Microwave oven. 4,131,778, Cl. 219-10.55F.
Tanaka, Minoru: *See—*
Sato, Yasuhito; Tanaka, Minoru; and Nakamura, Akihisa, 4,131,092, Cl. 123-32.0ST.
Tanaka, Taro: *See—*
Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, 4,131,086, Cl. 123-3.000.
Tanaka, Yoshiharu: *See—*
Komori, Masakazu; Shiga, Kazuyuki; Kitazato, Hajime; Okajima, Hiroaki; Tanaka, Yoshiharu; Nojima, Shoiti; Fukamachi, Masashige; and Kurima, Akinori, 4,131,565, Cl. 252-417.000.
Tanguy, Christian, to Societe Anonyme D.B.A. Charging valve for a fluid pressure accumulator. 4,131,125, Cl. 137-118.000.
Tanimura, Koichi: *See—*
Nagasaki, Katsumi; Tanimura, Koichi; Inoue, Yoshihiro; Yamazaki, Hiroyuki; and Momose, Tetsuo, 4,131,303, Cl. 285-302.000.
Tarpley, William B., Jr., to Energy and Minerals Research Co. Ultrasonic grinder. 4,131,238, Cl. 241-30.000.
Tatsukawa, Osami; Sakurai, Osamu; and Serizawa, Hisayuki, to Hitachi Heating Appliances Co., Ltd. High-frequency heating apparatus. 4,131,779, Cl. 219-10.55R.
Tatsuno, Hiyoshi, to Tokyo Tatsuno Co., Ltd. Apparatus for dispensing gasoline having an inverted U-shaped conduit. 4,131,218, Cl. 222-527.000.
Taylor, Samson R. Game board apparatus. 4,131,281, Cl. 273-248.000.
Taylor, Samuel K.: *See—*
Braden, Arthur B.; McBride, Thomas R.; Styblo, Donald J.; Taylor, Samuel K.; and Richey, Joseph B., 4,131,802, Cl. 250-445.00T.
Taylor, William E., Jr.; and Moughalian, Artin P., to Versabar Corporation. Concrete insert. 4,130,977, Cl. 52-710.000.
Technigraph Corporation: *See—*
Eddy, Albert W.; and Lyngklip, Roger W. (said Roger W. Lyngklip assors. to), 4,130,956, Cl. 40-1.500.
Teijin Limited: *See—*
Hashimoto, Satoshi; Okumura, Nobuya; and Kazama, Kiyoshi, 4,131,601, Cl. 528-279.000.
Nakamura, Yoshitsugu; Kawamura, Takeo; Saiki, Noritsugu; and Tokashiki, Michiyuki, 4,131,594, Cl. 260-40.00R.
Tektronix, Inc.: *See—*
Mossman, Ralph A., 4,131,821, Cl. 313-398.000.
Teledyne Industries, Inc.: *See—*
Lucy, Carl F., 4,131,498, Cl. 149-2.000.
Temtron Electronics Ltd.: *See—*
Lawrence, Noel L. W.; and Latti, Surinder S., 4,131,370, Cl. 366-273.000.
Tenneco, Inc.: *See—*
Laundy, James R., 4,131,007, Cl. 72-348.000.
Teramura, Hiroichi: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,131,915, Cl. 358-260.000.
Terashima, Isamu, to Hitachi, Ltd. Toner concentration detecting apparatus. 4,131,081, Cl. 118-646.000.
Terelak, Kazimierz: *See—*
Kiedik, Maciej; Grzywa, Edward; Kolt, Jozef; Terelak, Kazimierz; Czyz, Jerzy; and Niezgoda, Anna, 4,131,749, Cl. 568-781.000.
Terschuren, Wolfgang; Ries, Karl; and Lather, Dieter, to Mannesmann Aktiengesellschaft. Apparatus for ultrasonic inspection of the welding seam of large pipes. 4,131,027, Cl. 73-638.000.
Texaco Inc.: *See—*
Lachowicz, Donald R.; and Holder, Charles B., 4,131,577, Cl. 260-17.4CL.
Maham, Robert M.; and Beasley, Matthew D., 4,131,773, Cl. 200-61.050.
Textron Inc.: *See—*
Rotmans, Richard J., 4,131,246, Cl. 244-3.220.
Tezuka, Tohru: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,131,673, Cl. 424-247.000.
Thelen, Franz: *See—*
Bitterlich, Eberhard; Thelen, Franz; and Weber, Henning, 4,130,992, Cl. 60-652.000.
Thermo Electron Corporation: *See—*
Szycher, Michael, 4,131,604, Cl. 528-79.000.
Whalen, Robert L., 4,130,904, Cl. 3-1.400.
Theus, Richard: *See—*
Becker, Harry; Doerflinger, Karl; Ey, Klaus; Reiter, Georg; Rutzmoser, Hermann; and Theus, Richard, 4,131,934, Cl. 361-428.000.
Thiele, Kurt: *See—*
Zirngibl, Ludwig; Fischer, Johanna; and Thiele, Kurt, 4,131,608, Cl. 260-307.00D.
Thiokol Corporation: *See—*
Bertozzi, Eugene R., 4,131,716, Cl. 428-425.000.
Flanigan, David A., 4,131,499, Cl. 149-19.300.
Thomas, Manuel A.; and Cogan, Jerry A., Jr., to Milliken Research Corporation. Polymer-printed fabric and method for producing same. 4,131,422, Cl. 8-31.000.
Thompson, Jerry L.; Deluga, Sigmund S.; Harnach, James W.; and Shamah, Eliahu, to Standard Oil Company. Railway lubricating oil. 4,131,551, Cl. 252-33.000.
Thompson, Robert I.: *See—*
Witte, Michael; Saxe, Robert L.; and Thompson, Robert I., 4,131,334, Cl. 350-147.000.
Thomson-CSF: *See—*
Fyot, Jean-Jacques, 4,131,860, Cl. 330-279.000.
Thon, Dieter, to Safety Jet Skisicherheitsbugel GmbH. Tiltable and removable ski attachment. 4,131,291, Cl. 280-11.37E.
Thorogood, Robert M., to Air Products and Chemicals, Inc. Reversible heat exchanger or regenerator systems. 4,131,155, Cl. 165-1.000.
Thrower, Anthony: *See—*
Hind, Robert D.; Thrower, Anthony; and Cudby, Joseph W., 4,131,219, Cl. 222-603.000.
Tijburg, Rudolf P.; and van Dongen, Teunis, to U.S. Philips Corporation. Method of manufacturing a body having a gold pattern and body manufactured according to the method. 4,131,525, Cl. 204-129.650.
Toal, Hugh, to Congoleum Corporation. Wall edge trimmers for resilient floor coverings. 4,130,939, Cl. 30-293.000.
Tobias, Philip E. Low cost sensitometer which provides highly accurate readings. 4,131,349, Cl. 354-20.000.
Toda, Masaaki: *See—*
Kurono, Masayasu; Toda, Masaaki; Niwa, Haruki; Kosuge, Syunji; Iida, Takahumi; and Narita, Kenichi, 4,131,747, Cl. 562-469.000.
Todd, John A.: *See—*
Gerstenmaier, William J.; and Todd, John A., 4,131,216, Cl. 222-52.000.
Togashi, Takeshi: *See—*
Tamura, Yoshihiro; and Togashi, Takeshi, 4,131,213, Cl. 221-14.000.
Tokashiki, Michiyuki: *See—*
Nakamura, Yoshitsugu; Kawamura, Takeo; Saiki, Noritsugu; and Tokashiki, Michiyuki, 4,131,594, Cl. 260-40.00R.
Tokico Ltd.: *See—*
Tanabe, Hisao, 4,131,139, Cl. 141-4.000.
Tokyo Shibaura Denki K.K.: *See—*
Gocho, Choichi, 4,131,829, Cl. 318-139.000.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Asahi, Hiroji, 4,131,951, Cl. 365-203.000.
Ichinose, Noboru; Ookuma, Hideo; Mizutani, Toshiaki; and Hiraki, Hideaki, 4,131,479, Cl. 106-39.500.
Kinoshita, Hiroyuki, 4,131,906, Cl. 357-41.000.
Matsuda, Takashi; Niwa, Kazuo; and Sumitomo, Yasusuke, 4,131,909, Cl. 357-49.000.
Momose, Kenichiro; and Kumagai, Kiyoshi, 4,131,494, Cl. 148-31.570.
Nakai, Kaichiro; and Saito, Hisao, 4,131,824, Cl. 315-39.510.
Shiraogawa, Yukio, 4,131,943, Cl. 364-200.000.
Suzuki, Shuichi; and Wada, Moriyasu, 4,131,632, Cl. 260-834.000.

Washida, Hiroshi, 4,131,820, Cl. 313-377.000.
Tokyo Tatsuno Co., Ltd.: *See—*
Tatsuno, Hiyoshi, 4,131,218, Cl. 222-527.000.
Tombrel, Francis: *See—*
Pflieger, Bernard; Sauvage, Philippe; and Tombrel, Francis, 4,131,151, Cl. 164-89.000.
Tonka Corporation: *See—*
Ohashi, Yutaka, 4,130,963, Cl. 46-209.000.
Tonomura, Shinji: *See—*
Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,131,673, Cl. 424-247.000.
Torr, Alan C., to Expert Industrial Controls Limited. Solenoid devices. 4,131,866, Cl. 335-262.000.
'Totes', Incorporated: *See—*
Brooks, C. Robert, 4,131,122, Cl. 135-76.000.
Toth, Louis M.: *See—*
Friedman, Horace A.; Toth, Louis M.; and Bell, Jimmy T., 4,131,527, Cl. 204-157.10R.
Toyko Sanyo Electric Co., Ltd.: *See—*
Houshi, Teruo, 4,131,828, Cl. 318-138.000.
Toyo Boseki Kabushiki Kaisha: *See—*
Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.
Toyo Jihoki Manufacturing Co., Ltd.: *See—*
Hamagawa, Hiroshi, 4,131,855, Cl. 328-129.000.
Toyoda-Koki Kabushiki-Kaisha: *See—*
Etoh, Kunihiko; and Sugiura, Katsumi, 4,131,838, Cl. 318-603.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Sawada, Daisaku; Goto, Kenji; Shigemaut, Takashi; Takeda, Yuji; Hattori, Tadashi; Yamaguchi, Hiroaki; and Nishida, Minoru, 4,131,097, Cl. 123-117.00R.
Trabbold, Harold J.; and Hummel, Jerry R., to Air Products and Chemicals, Inc. Underwater cutting and gouging torch. 4,131,780, Cl. 219-70.000.
Trelleborg Rubber Company, Inc.: *See—*
Andersson, Sven E., 4,131,194, Cl. 198-497.000.
Trio Kabushiki Kaisha: *See—*
Maeda, Yoichi, 4,131,180, Cl. 181-163.000.
Triumph Werke Nurnberg A.G.: *See—*
Hengelhaupt, Hans, 4,131,372, Cl. 400-196.100.
Trowbridge, Lyle N.: *See—*
Edwards, Lars T.; and Trowbridge, Lyle N., 4,131,455, Cl. 75-118.00R.
TRW Inc.: *See—*
Martin, Jon W., 4,131,726, Cl. 526-18.000.
Powers, Thomas R., 4,131,383, Cl. 407-114.000.
Tsentralny Nauchno Issledovatelsky Avtomobilny i Avtomotorny Institut Nami: *See—*
Rumyantsev, Leonid A.; Esenovsky-Lashkov, Jury K.; Avershin, Vasily T.; Ilnitsky, Vladimir Y.; and Jurin, Ivan L., 4,131,184, Cl. 192-3.260.
Tsuboi, Masayoshi; Suzuki, Yoshiaki; and Tabei, Masatoshi, to Fuji Photo Film Co., Ltd. Electric recording process of images using electron sensitive layer containing trivalent cobalt complex and compound having conjugated π bond system. 4,131,463, Cl. 96-1.00E.
Tsuchiya, Takuichi; and Shinagawa, Shinichi, to Nippon Electric Company, Ltd. A.C. power supply circuit with surge current suppression. 4,131,927, Cl. 361-6.000.
Tsujimoto, Kazumi N.; and McLeod, Paul S., to Airco, Inc. Multiple electron-beam vapor source assembly. 4,131,753, Cl. 13-31.0EB.
Tsujimoto, Minoru; Okada, Minoru; Suzuki, Yuji; and Hirai, Toshihiro, to Daido Sanso Kabushiki Kaisha. Process for the mass production of ozone. 4,131,528, Cl. 204-157.10R.
Tsukahara, Satoshi: *See—*
Sato, Isao; Uchiyama, Yoshihiro; Ishibashi, Youji; Tsukahara, Satoshi; Oshima, Ryoichiro; and Hishinuma, Yukio, 4,131,432, Cl. 422-177.000.
Tsunekawa, Tokuichi: *See—*
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Kawana, Hiroyoshi; Ono, Yusuke; and Matsuda, Mutsuhide, 4,131,350, Cl. 354-31.000.
Tuftamatic, Inc.: *See—*
Randolph, Arthur J., 4,130,935, Cl. 29-706.000.
Turk, Herbert: *See—*
Dammann, Peter; Schippers, Heinz; Turk, Herbert; and Schiminski, Herbert, 4,130,983, Cl. 57-5.000.
Tuscarora Cotton Mill: *See—*
Lambert, John W., Jr., 4,130,984, Cl. 57-12.000.
Tyler, Hugh J., to Robertshaw Controls Company. Electrical heater construction. 4,131,787, Cl. 219-532.000.
Tyler, Hugh J., to Robertshaw Controls Company. Electrical heater construction. 4,131,789, Cl. 219-541.000.
Tynan, Daniel G., to Du Pont de Nemours, E. I., and Company. Co-rotating multiple screw processor. 4,131,371, Cl. 366-301.000.
Ube Industries, Inc.: *See—*
Nagasaka, Akira; Ashitaka, Hidetomo; Kusuki, Yoshihiro; Oda, Denichi; and Yoshinaga, Toshimune, 4,131,644, Cl. 423-447.500.
Uchikawa, Hiroshi; and Kato, Hajime, to Onoda Cement Company, Ltd. Molding sand mixtures. 4,131,474, Cl. 106-38.350.
Uchiyama, Hiroshi, to E. C. Chemical Ind. Co., Ltd.; and C. Itoh & Co. Process for purifying crude dibenzylidene sorbitol. 4,131,612, Cl. 260-340.700.
Uchiyama, Takashi; Suzuki, Ryoichi; Tsunekawa, Tokuichi; Kawana, Hiroyoshi; Ono, Yusuke; and Matsuda, Mutsuhide, to Canon Kabushiki Kaisha. Exposure control device for camera. 4,131,350, Cl. 354-31.000.
Uchiyama, Yoshihiro: *See—*
Sato, Isao; Uchiyama, Yoshihiro; Ishibashi, Youji; Tsukahara, Satoshi; Oshima, Ryoichiro; and Hishinuma, Yukio, 4,131,432, Cl. 422-177.000.
Udipi, Kishore, to Phillips Petroleum Company. Polymer epoxidation process. 4,131,725, Cl. 526-56.000.
Udipi, Kishore: *See—*
Hsieh, Henry L.; and Udipi, Kishore, 4,131,653, Cl. 260-880.00B.
Uhl, Richard G.: *See—*
Gellatly, Grant; and Uhl, Richard G., 4,131,118, Cl. 131-140.00C.
Kite, George F.; Gellatly, Grant; and Uhl, Richard G., 4,131,117, Cl. 131-140.00C.
Uhlmann, Georg, to Rheintechnik Weiland & Kaspar K.G. Cutter for animal hooves and claws. 4,130,938, Cl. 30-192.000.
Uminski, Jerzy: *See—*
Klopotek, Alojzy; Uminski, Jerzy; and Dziala, Gabriela, 4,131,556, Cl. 252-106.000.
Underwood, William C., to Martin Marietta Corporation. Wide instantaneous dynamic range proportional signal processor. 4,131,254, Cl. 244-3.160.
Union Carbide Corporation: *See—*
Hodakowski, Leonard E.; and Carder, Charles H., 4,131,602, Cl. 528-49.000.
Lustig, Stanley; and Vasudevan, Ganapathy, 4,131,137, Cl. 138-118.100.
Rinfret, Arthur P., 4,131,200, Cl. 206-484.000.
United States of America
Agriculture: *See—*
Koch, Peter, 4,131,146, Cl. 144-221.000.
Air Force: *See—*
Arnold, Fred E.; Loughran, Gerard A.; and Wereta, Anthony, Jr., 4,131,625, Cl. 260-607.0AR.
Arnold, Fred E.; and Wolfe, James F., 4,131,748, Cl. 562-488.000.
Debrotnic, John S., 4,131,438, Cl. 55-204.000.
De Pierre, Vincent; and Gurney, Ferdinand J., 4,131,461, Cl. 75-208.0CS.
Holland-Moritz, Ervin K., 4,131,852, Cl. 325-363.000.
Mar, Henry Y. B.; and Zimmer, Paul B., 4,131,593, Cl. 260-37.0SB.
Schlossberg, Howard, 4,131,792, Cl. 250-199.000.
Army: *See—*
F'Geppert, Erwin, 4,131,256, Cl. 248-3.000.
Shopalovich, Predrag, 4,130,917, Cl. 205.1 R.
Skahill, Fred J., 4,131,052, Cl. 89-11.000.
Energy: *See—*
Cooper, Martin H., 4,131,510, Cl. 176-50.000.
Friedman, Horace A.; Toth, Louis M.; and Bell, Jimmy T., 4,131,527, Cl. 204-157.10R.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Miller, Charles G.; and Stephens, James B. Primary reflector for solar energy collection systems. 4,131,336, Cl. 350-292.000.
Phillips, Wayne M. High temperature resistant cermet and ceramic compositions. 4,131,459, Cl. 75-203.000.
National Aeronautics and Space Administration: *See—*
Brandhorst, Henry W., Jr., 4,131,486, Cl. 136-89.0SJ.
Navy: *See—*
Anderson, William B., 4,131,873, Cl. 340-6.00R.
Barzda, Justin J., 4,131,392, Cl. 416-142.000.
Dietz, Charles R., 4,131,065, Cl. 102-49.400.
Ferguson, Wilfred J., 4,131,053, Cl. 89-36.00A.
Schmidt, Jacob, deceased, 4,131,390, Cl. 416-20.00R.
Stoutmeyer, Ronald G.; and Alltop, William O., 4,131,793, Cl. 250-211.00J.
Walker, Basil E.; Pohanka, Robert C.; Smith, Paul L.; and Rice, Roy W., 4,131,444, Cl. 65-32.000.
Wynne, Kenneth J.; and Davison, John B., 4,131,609, Cl. 260-314.500.
U.S. Philips Corporation: *See—*
Baars, Nicolaas J., 4,131,809, Cl. 307-303.000.
Bruninx, Edward, 4,131,794, Cl. 250-272.000.
Claasen, Theodoor A. C. M.; and Mecklenbrauker, Wolfgang F. G., 4,131,764, Cl. 179-15.0FS.
Daub, Dirk; and Klaver, Olof E. H., 4,131,908, Cl. 357-42.000.
Gieles, Antonous C. M., 4,131,524, Cl. 204-129.300.
Korver, Jan A. C., 4,131,807, Cl. 307-228.000.
Mattsson, Lennart P. J., 4,131,825, Cl. 315-39.610.
Tijburg, Rudolf P.; and van Dongen, Teunis, 4,131,525, Cl. 204-129.650.
van Santen, Johannes G., 4,131,950, Cl. 365-183.000.
United States Steel Corporation: *See—*
Bode, Charles H., Jr.; Saggio, Anthony S.; Wagner, George J., Jr.; and Wessel, Richard L., 4,131,220, Cl. 222-607.000.
Felkel, Edward M., 4,131,757, Cl. 174-107.000.
Felkel, Edward M., 4,131,758, Cl. 174-107.000.
Felkel, Edward M., 4,131,759, Cl. 174-107.000.
Hind, Robert D.; Thrower, Anthony; and Cudby, Joseph W., 4,131,219, Cl. 222-603.000.
Kachik, Robert H.; and Pignocco, Arthur J., 4,131,473, Cl. 106-1.120.
United Technologies Corporation: *See—*
Brodell, Robert F., 4,131,388, Cl. 415-138.000.
Untch, Karl G.; and Stork, Gilbert J., to Syntex (USA) Inc. (dl)-13-Sub-

stituted sulfinyl-prostaglandin-like compounds and methods of making. 4,131,746, Cl. 560-255.000.
UOP Inc.: *See—*
Adams, Frank H.; and Knapik, H. Peter G., 4,131,536, Cl. 208-139.000.
Antos, George J.; Hayes, John C.; and Pollitzer, Ernest L., 4,131,628, Cl. 260-666.00A.
Upjohn Company, The: *See—*
Smith, Herman W., 4,131,738, Cl. 560-121.000.
Usubov, Zokhrab G. O.: *See—*
Kagan, Naum Y.; Bortnik, Vladimir M.; Korenbljum, Isai V.; Razumeev, Jury A.; Lyass, Abram M.; Borsuk, Pavel A.; Usubov, Zokhrab G. O.; and Dmitrieva, Valentina A., 4,131,477, Cl. 106-38.350.
Utsunomiya, Kei; Soga, Kazuya; Shimasaki, Katsunori; Mito, Yutaka; Oaki, Mamoru; Haseba, Shigeru; Miki, Hiroetu; and Masaki, Michiko, to Kobe Steel Limited. Catalyst for converting nitrogen oxides and method for converting nitrogen oxides in exhaust gases by using said catalyst. 4,131,643, Cl. 423-239.000.
Valade, Gerard. Radiator core support device. 4,131,268, Cl. 269-47.000.
Valle, Pierre D., to Compagnie Industrielle des Telecommunications Cit-Alcatel. Method of compensation of intermodulation noise and devices for the implementing thereof. 4,131,859, Cl. 330-124.00R.
Vallee, Bert L.: *See—*
Lange, Louis G., III; and Vallee, Bert L., 4,131,727, Cl. 526-23.000.
Van Kooten B.V.: *See—*
Schnell, Hans G., 4,131,166, Cl. 173-43.000.
VanAuken, Richard L., to Exxon Research & Engineering Co. Composite tubular elements. 4,131,701, Cl. 428-36.000.
van den Berg, Henrikus J.; and Hurkmans, Gerardus C. A. M. Protective device particularly for welding and cutting work. 4,130,903, Cl. 2-8.000.
Vanderburg, Raymond M.: *See—*
Crumrine, Albert W., Jr.; Fones, Theodore H.; Kostas, James M.; and Vanderburg, Raymond M., 4,131,156, Cl. 165-51.000.
van der Lely, Ary; and Bom, Cornelis J. G., to C. van der Lely NV. Spreading implements. 4,131,237, Cl. 239-664.000.
van der Lely, Cornelis. Tractor having dual side-by-side engines. 4,131,170, Cl. 180-53.0FE.
Vandling, John M.: *See—*
Burton, Jack D.; and Vandling, John M., 4,131,917, Cl. 358-281.000.
van Dongen, Teunis: *See—*
Tijburg, Rudolf P.; and van Dongen, Teunis, 4,131,525, Cl. 204-129.650.
Van Loo, William R.: *See—*
Knapp, Robert L.; Blodee, Leif; and Van Loo, William R., 4,131,314, Cl. 297-248.000.
Van Moss, John H., Jr. Artificial reef to prevent shoreline erosion. 4,130,994, Cl. 405-24.000.
Van Poucke, Raphael K.; Baeyens, Freddy C.; and Mortelmans, Paul A., to AGFA-Gevaert, N.V. Preparation of α-acylacetamides using tetramethyl guanidine condensing agent. 4,131,735, Cl. 544-267.000.
Van Rens, Russell J.: *See—*
Cavil, David T.; McAuliffe, Gerald N.; and Van Rens, Russell J., 4,131,832, Cl. 318-358.000.
van Santen, Johannes G., to U.S. Philips Corporation. Charge transfer device. 4,131,950, Cl. 365-183.000.
Varga, Joseph A., to Ceeco Machinery Manufacturing Limited. Reel carrying system fail-safe locking device. 4,130,985, Cl. 57-127.500.
Varian Associates, Inc.: *See—*
Wilder, Marshall, deceased, 4,131,818, Cl. 313-95.000.
Varker, Alan E.: *See—*
Bernstein, Philip; Coffey, James P.; and Varker, Alan E., 4,131,637, Cl. 260-877.000.
Varlonga, Giovanni. Panel for soundproof and fireproof inner walls. 4,130,972, Cl. 52-241.000.
Vasiliev, Alexei V.: *See—*
Muzhzhavlev, Konstantin D.; Yazev, Vladimir D.; Schegolev, Vladimir I.; Ivanov, Andrei B.; Vasiliev, Alexei V.; Romanenko, Oleg N.; Kosarev, Sergei P.; and Ovcharenko, Vladimir G., 4,131,522, Cl. 204-60.000.
Vasudevan, Ganapathy: *See—*
Lustig, Stanley; and Vasudevan, Ganapathy, 4,131,137, Cl. 138-118.100.
VEB Filmfabrik Wolfen: *See—*
Fischer, Gunther; Wenzel, Beate; Scheithauer, Steffen; Franz, Udo; Junge, Karl-Wilhelm; Schroter, Christof; Gahler, Siegfried; and Morgenstern, Johannes, 4,131,470, Cl. 96-107.000.
Verger, Bernard: *See—*
Chillier-Duchatel, Nicole; and Verger, Bernard, 4,131,532, Cl. 204-256.000.
Vermette, Howard H. Portable lift. 4,131,181, Cl. 187-11.000.
Vernaleken, Hugo: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; and Nouvertne, Werner, 4,131,575, Cl. 260-17.40R.
Versabar Corporation: *See—*
Taylor, William E., Jr.; and Moughalian, Artin P., 4,130,977, Cl. 52-710.000.
Vial, Raymond; Fastert, Herbert; and Marti, Heinrich, to Concast AG. Roller apron for a continuous casting installation for steel. 4,131,154, Cl. 164-448.000.
Vilkomerson, David H. R.: *See—*
Mezrich, Reuben S.; and Vilkomerson, David H. R., 4,131,024, Cl. 73-606.000.
Vinch, Samuel D.: *See—*
Flowers, Thomas A.; Marra, Anthony W.; and Vinch, Samuel D., 4,131,664, Cl. 264-510.000.
Vock, Manfred H.: *See—*
Mussinan, Cynthia J.; Mookherjee, Braja D.; Vock, Manfred H.; Schmitt, Frederick L.; Shuster, Edward J.; Sanders, James M.; Light, Bette M.; and Granda, Edward J., 4,131,687, Cl. 426-3.000.
Voet, Harry C., to Dayco Corporation. Fire-resistant construction, method of making same, and carpet construction employing same. 4,131,703, Cl. 428-95.000.
Vogelsang, Alois. Mechanism for controlling movements of a tool. 4,130,968, Cl. 51-100.00R.
Vogtherr, Burkhard, to Drabert Sohne, Firma. Chair with deformable armrest. 4,131,315, Cl. 297-286.000.
Volat, Jean-Pierre; and Pichon, Jean-Louis E., to BERTIN & Cie. Conveyor device for letters, cards or other thin article. 4,131,320, Cl. 302-2.00R.
von Bockh, Peter: *See—*
Chawla, Jogindar M.; von Bockh, Peter; and Dornemann, Manfred, 4,131,015, Cl. 73-199.000.
von der Heyde, Richard C.; and Head, William J., to Goodyear Tire & Rubber Company, The. Method for mounting a tire bladder. 4,130,928, Cl. 29-450.000.
Von Gruner, Horst: *See—*
Wendt, Hartmut; Von Gruner, Horst; and Janssen, Harald, 4,131,693, Cl. 427-117.000.
von Kutepow, Nikolaus; Mueller, Franz J.; and Reuter, Peter, to BASF Aktiengesellschaft. Separating rhodium from solution containing rhodium carbonyl complexes and converting the separated rhodium into soluble rhodium carbonyl complexes. 4,131,640, Cl. 423-22.000.
Vuilleumier, Ralph O., to Container Corporation of America. Feed mechanism for carton blanks. 4,131,208, Cl. 214-8.50F.
Wachs, Walter; and Stickel, Heinz, to Siemens Aktiengesellschaft. Magnetic-head locating arrangement for floppy-disk mechanisms. 4,131,923, Cl. 360-106.000.
Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
Authier, Bernhard; Griesshammer, Rudolf; Koppl, Franz; Lang, Winfried; Sirtl, Erhard; and Rath, Heinz-Jorg, 4,131,659, Cl. 264-25.000.
Wada, Moriyasu: *See—*
Suzuki, Shuichi; and Wada, Moriyasu, 4,131,632, Cl. 260-834.000.
Wafilin B.V.: *See—*
de Putter, Warner J., 4,131,541, Cl. 210-23.00F.
Wagner, George J., Jr.: *See—*
Bode, Charles H., Jr.; Saggio, Anthony S.; Wagner, George J., Jr.; and Wessel, Richard L., 4,131,220, Cl. 222-607.000.
Wagner, Richard J. Automatic starter for vehicle. 4,131,304, Cl. 290-38.00C.
Wakahara, Yasushi: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamazaki, Yasuhiro; and Wakahara, Yasushi, 4,131,915, Cl. 358-260.000.
Walker, Basil E.; Pohanka, Robert C.; Smith, Paul L.; and Rice, Roy W., to United States of America, Navy. Method for increasing the strength and density of lead titanate ceramic bodies. 4,131,444, Cl. 65-32.000.
Walker, Wendell C., to General Electric Company. Iron self-clean valve assembly. 4,130,954, Cl. 38-77.830.
Wallshein, Melvin. Method of making orthodontic appliance having replaceable tooth engaging means. 4,130,921, Cl. 29-160.600.
Walter, Arthur: *See—*
Sick, Erwin; Walter, Arthur; and Fetzer, Gunter, 4,131,804, Cl. 250-566.000.
Walters, John P.: *See—*
Erickson, Wayne K.; and Walters, John P., 4,131,704, Cl. 428-95.000.
Wang, Chih-Chung: *See—*
Kim, Jonathan J.; Loose, Thomas A.; and Wang, Chih-Chung, 4,131,453, Cl. 75-72.000.
Wanner, Karl; Bleicher, Manfred; and Falchle, Jorg, to Robert Bosch GmbH. Hammer drill. 4,131,165, Cl. 173-48.000.
Warland, George W.; and Crisp, Norman F., to Borg-Warner Limited. Rotary drive member. 4,131,032, Cl. 74-449.000.
Warth, Guy M.: *See—*
Brown, Milton S.; Burch, Richard M.; and Warth, Guy M., 4,131,641, Cl. 423-34.000.
Washida, Hiroshi, to Tokyo Shibaura Electric Co., Ltd. Secondary electron multiplication target. 4,131,820, Cl. 313-377.000.
Watanabe, Fumitaka: *See—*
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Watanabe, Tsukasa: *See—*
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Watson, George H.; and Speer, Thomas L., to Standard Oil Company (Indiana). Slurry backfilling of in situ oil shale retort. 4,131,416, Cl. 299-2.000.
Watson, Ronald S. External portable propeller rotator. 4,131,249, Cl. 244-53.00A.
Wavin B.V.: *See—*
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Weber, Henning: *See—*
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Webster, Desmond E. C. Locating lock cases in doors. 4,130,930, Cl. 29-466.000.

Weckenmann, Albert; Brauticam, Rolf; and Haas, Lothar, to Robert Bosch GmbH. Switchbox and control unit assembly for automotive vehicles. 4,131,772, Cl. 200-61.540.

Weigers, Wilhelmus J.: *See*—
Hall, John B.; and Weigers, Wilhelmus J., 4,131,555, Cl. 252-89.00R.

Weiland, Richard H.: *See*—
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Weinstein, Stephen B., to Bell Telephone Laboratories, Incorporated. Echo cancellation in two-wire, two-way data transmission systems. 4,131,767, Cl. 179-170.200.

Weinstock, Leonard M.; Wildman, Arthur S.; and Mulvey, Dennis M., to Merck & Co., Inc. Preparation of salicylic acid and derivatives. 4,131,618, Cl. 562-469.000.

Weiss, Martin J.: *See*—
Floyd, Middleton B., Jr.; Weiss, Martin J.; Gredeinskas, Charles V.; and Chen, Sow-mei C., 4,131,737, Cl. 560-121.000.

Weissenbach, Joseph. Contained volatile liquids vapor retention system. 4,131,141, Cl. 141-285.000.

Weitzel, Charles E.; and Capewell, David R., to RCA Corporation. Method of making silicon on sapphire field effect transistors with specifically aligned gates. 4,131,496, Cl. 148-175.000.

Wendt, Hartmut; Von Gruner, Horst; and Janssen, Harald, to Dr. Beck & Co AG. Hardenable polyesterurethane composition for producing a directly tinnable wire. 4,131,693, Cl. 427-117.000.

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Wereta, Anthony, Jr.: *See*—
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Werner, James L.: *See*—
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Werner, Michael F., to Skyline Corporation. Chassis for a mobile home. 4,131,301, Cl. 280-789.000.

Wessel, Karl-Heinz: *See*—
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Wessel, Richard L.: *See*—
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Wessel, Wolf; and Grieshaber, Hermann, to Robert Bosch GmbH. Idling and warm-up fuel control device. 4,131,099, Cl. 123-119.00F.

West, C. Thomas, to Standard Oil Company (Indiana). Alkylbenzene sulfonic acid modified mannich reaction products from oxidized polymers. 4,131,553, Cl. 252-33.000.

West Electric Co., Ltd.: *See*—
Iwata, Hiroshi; and Yamaoka, Tetsuo, 4,131,351, Cl. 354-60.00F.

Western Electric Company, Inc.: *See*—
Caruso, Robert D.; and Setter, Gerald A., Jr., 4,131,484, Cl. 134-1.000.
Pearce, Charles W.; and Zaleckas, Vincent J., 4,131,487, Cl. 148-1.500.

Westinghouse Electric Corp.: *See*—
Bass, Jerry D., 4,131,182, Cl. 187-29.00G.
Crookston, Ronald W.; and Meyer, Thomas N., 4,131,774, Cl. 200-82.00B.
Gemp, Robert S., 4,131,936, Cl. 363-43.000.
Geohegan, Kenneth P., Jr., 4,131,874, Cl. 340-10.000.
Kub, Francis J., 4,131,902, Cl. 357-6.000.
Meyer, Jeffry R.; and Hess, Robert L., 4,131,775, Cl. 200-148.00R.
Milberger, Walter E.; and Rowe, Frederick J., 4,131,938, Cl. 363-101.000.
Miller, Coleman J., 4,131,896, Cl. 343-815.000.
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Niehenke, Edward C.; and Klein, Gerald I., 4,131,858, Cl. 330-4.900.
Ryan, Frederick M.; and Handke, Paul C., 4,131,064, Cl. 102-1.00R.

Westvaco Corporation: *See*—
Brown, Wynford, 4,131,573, Cl. 260-17.500.
Dilling, Peter, 4,131,564, Cl. 252-353.000.

Whalen, Robert L., to Thermo Electron Corporation. Prosthetic blood conduit. 4,130,904, Cl. 3-1.400.

Wheeler, Raymond L., to British Hovercraft Corporation Ltd. Air cushion vehicles. 4,131,175, Cl. 180-127.000.

Whetham, William J., to Boeing Company, The. Machine tool monitoring system. 4,131,837, Cl. 318-571.000.

Whitaker, Thomas E.; Myles, Samuel; and Gardner, Ian P., to Johns-Manville Corporation. Process for the manufacture of calcium silicate hydrate objects. 4,131,638, Cl. 264-333.000.

White, Jack D., Jr., to Dayco Corporation. Covering for power transmission belt. 4,131,030, Cl. 74-232.000.

Whitehead Brothers Company: *See*—
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Whittaker, Roger L.; and Hewitt, Clyde, to Hanes Corporation. Yarn binder apparatus. 4,130,999, Cl. 66-145.00R.

Whyte, Theodore R.: *See*—
Hill, Maynard L.; and Whyte, Theodore R., 4,131,013, Cl. 73-181.000.

Wiand, Ronald C. Ophthalmic flat roughing wheel. 4,131,436, Cl. 51-309.00R.

Wideman, Lawson G., to Goodyear Tire & Rubber Company, The. Continuous hydrogenation of cyclopentadiene to cyclopentene using a Raney nickel catalyst saturated with ammonia. 4,131,627, Cl. 260-666.00A.

Wideman, Lawson G.; and Ofstead, Eilert A., to Goodyear Tire & Rubber Company, The. Selective hydrogenation of cyclopentadiene to cyclopentene using Raney nickel catalyst and water in the reaction mixture. 4,131,629, Cl. 260-666.00A.

Wiechert, Rudolf: *See*—
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Wiegers, Wilhelmus J.: *See*—
Hall, John B.; and Wiegers, Wilhelmus J., 4,131,557, Cl. 252-132.000.

Wiesner, Wolfgang, to Siemens Aktiengesellschaft. Circuit arrangement for setting a rotatable type carrier over the shortest path of rotation. 4,131,840, Cl. 318-685.000.

Wilcox, Glade. Single side band radio apparatus. 4,131,850, Cl. 325-137.000.

Wilde, Michael A.; and Lucas, David J., to Avon Tyres Limited. Tire building drum. 4,131,500, Cl. 156-131.000.

Wilder, Marshall, deceased (by Wilder, Virginia H., executrix), to Varian Associates, Inc. Night vision system. 4,131,818, Cl. 313-95.000.

Wilder, Virginia H., executrix: *See*—
Wilder, Marshall, deceased, 4,131,818, Cl. 313-95.000.

Wildman, Arthur S.: *See*—
Weinstock, Leonard M.; Wildman, Arthur S.; and Mulvey, Dennis M., 4,131,618, Cl. 562-469.000.

Wilke, Gerhard. Process for the production of dried food products. 4,131,689, Cl. 426-242.000.

Willem, Michel, to Ceraver S.A. Method of producing a rod anchoring structure. 4,130,926, Cl. 29-421.00M.

Williams, George C.: *See*—
Alden, John M.; and Williams, George C., 4,131,901, Cl. 346-165.000.

Williams, George J.; and Boyer, Robert C., to Ecolaire Incorporated. Means for positioning steam condenser tube support plates. 4,131,270, Cl. 269-321.00W.

Williams, Malcolm, to Lucas Electrical Company Limited, The. Fuel injection system for an internal combustion engine. 4,131,087, Cl. 123-32.0EA.

Williamson, William R. N.: *See*—
Evans, Delme; Saunders, John C.; and Williamson, William R. N., 4,131,682, Cl. 424-275.000.

Wilputte Corporation: *See*—
Eck, John C., 4,131,435, Cl. 48-61.000.

Wilschut, Frits M. W., to Synres International B.V. Thermosetting polyester compositions. 4,131,635, Cl. 260-862.000.

Wilson, Stephen G. Skate with replaceable blade. 4,131,288, Cl. 280-11.170.

Windele, Josef, to Siemens Aktiengesellschaft. Device for moving a path of a moving data carrier toward and away from a surface area of a sub-carrier. 4,131,358, Cl. 355-3.0TR.

Winter, William E.; and Luzarraga, Mamerto G., to Exxon Research & Engineering Co. Naphtha hydrofining process. 4,131,537, Cl. 208-216.000.

Wirnitzer, Franz: *See*—
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Wirth, Manfred N.: *See*—
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Wirth, Richard E.; and Wirth, Manfred N. Automotive turbine engine. 4,130,989, Cl. 60-39.520.

Witte, Michael; Saxe, Robert L.; and Thompson, Robert I., to Research Frontiers Incorporated. Light polarizing materials, suspensions thereof, and process for manufacturing such suspensions. 4,131,334, Cl. 350-147.000.

Witzel, Bruce E.: *See*—
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,131,677, Cl. 424-256.000.

Wojcik, Ronald T., to Arizona Chemical Company. Catalyst for cationic polymerization process. 4,131,567, Cl. 252-435.000.

Wojcik, Walter J.: *See*—
Shea, Vincent; and Wojcik, Walter J., 4,131,363, Cl. 355-75.000.

Wolfe, James F.: *See*—
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Wolfgram, Kenneth C., to Caterpillar Tractor Co. Access panel for enclosures. 4,131,172, Cl. 180-69.00R.

Wollam, Carl A.: *See*—
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Wood, Peter: *See*—
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Wood, Reggie D., to Campbell, Richard A., a part interest. Telephone switch control clip. 4,131,768, Cl. 179-178.000.

Wooding Corporation: *See*—
Wooding, Patrick J., 4,131,752, Cl. 13-9.0ES.

Wooding, Patrick J., to Wooding Corporation. Current conducting atmosphere control sleeve for electroslag furnace. 4,131,752, Cl. 13-9.0ES.

Woods, Lee O.: *See*—
Haag, Donald L.; and Woods, Lee O., 4,131,871, Cl. 338-220.000.

Wooters, Eldon W.: *See—*
McAuliffe, Gerald N.; and Wooters, Eldon W., 4,131,833, Cl. 318-440.000.
Worrell, Robert A., Sr., to Scott Paper Company. Disposable, compactable moisture impervious package for premoistened sheets. 4,131,195, Cl. 206-205.000.
Wright, Howard S. Hydraulic pumps. 4,130,991, Cl. 60-477.000.
Wright, Jeffrey L.: *See—*
Fletcher, Steven J.; Wright, Jeffrey L.; and Davis, Richard S., 4,131,949, Cl. 364-900.000.
Wright, Norman Z.; and Printy, Davey L., to Rockwell International Corporation. Push-pull and rotating knob. 4,131,033, Cl. 74-553.000.
Wuerzer, Bruno: *See—*
Koenig, Karl-Heinz; Schirmer, Ulrich; Wuerzer, Bruno; and Fett, Kurt, 4,131,751, Cl. 560-29.000.
Wurst, John W., to Singer Company, The. Speed limiter for pattern stitch sewing machine. 4,131,075, Cl. 112-158.00E.
Wylain, Inc.: *See—*
Deters, Elmer M., 4,131,140, Cl. 141-206.000.
Wyler, Sigfried: *See—*
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Wynne, Kenneth J.; and Davison, John B., to United States of America, Navy. Silicon-phthalocyanine-siloxy monomers. 4,131,609, Cl. 260-314.500.
Xerox Corporation: *See—*
Forbes, Richard L., 2nd, 4,131,357, Cl. 355-3.0DD.
Gillett, Kenneth; Steiner, Edward L.; Fiske, Kenton W.; Davis, Kenneth A.; Kukucka, William P.; Criswell, Thomas; and Richardson, Philip, 4,131,942, Cl. 364-200.000.
Mager, George E.; Nelson, Frank M.; and Hall, Warren L., 4,131,944, Cl. 364-200.000.
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Yakovenko, Anatoly A.: *See—*
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Yamaga, Makoto: *See—*
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Yamaguchi, Hiroaki: *See—*
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Yamamoto, Keizo: *See—*
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Yamanaka, Seisuke; Nagumo, Fumio; and Nishimura, Toshimichi, to Sony Corporation. Solid state television camera. 4,131,913, Cl. 358-44.000.
Yamaoka, Tetsuo: *See—*
Iwata, Hiroshi; and Yamaoka, Tetsuo, 4,131,351, Cl. 354-60.00F.
Yamasaki, Masahiro: *See—*
Iwahashi, Shunji; Yamasaki, Masahiro; and Fujita, Takanori, 4,131,483, Cl. 134-1.000.
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Yaple, William R.: *See—*
Agard, Richard L.; Bocinski, Terrence E.; Brearley, Lawrence E.; and Yaple, William R., 4,131,933, Cl. 361-415.000.
Yasuo, Sumi. Detector for a pneumatic tire. 4,131,878, Cl. 340-58.000.
Yazev, Vladimir D.: *See—*
Muzhzhavlev, Konstantin D.; Yazev, Vladimir D.; Schegolev, Vladimir I.; Ivanov, Andrei B.; Vasiliev, Alexei V.; Romanenko, Oleg N.; Kosarev, Sergei P.; and Ovcharenko, Vladimir G., 4,131,522, Cl. 204-60.000.
Yeager, Robert R., to Lambert Corporation. Planting and fertilizing apparatus. 4,131,221, Cl. 222-624.000.
Yoshida Kogyo K.K.: *See—*
Ishii, Susumu; and Aoki, Tsunetaka, 4,130,918, Cl. 24-205.14A.
Yoshida, Kohsaku: *See—*
Hara, Kunio; and Yoshida, Kohsaku, 4,131,009, Cl. 72-391.000.
Yoshida, Masashi; Iino, Yasuo; and Sato, Katsuya, to Hitachi, Ltd. Operation device of tape recorder. 4,131,922, Cl. 360-90.000.
Yoshida, Tohji: *See—*
Takematsu, Shigeru; Yoshida, Tohji; Ikushima, Yukio; Takeuchi, Kunio; Kakinaka, Arao; Matsunaga, Koichi; Shimakura, Mamoru; and Komura, Yoji, 4,131,803, Cl. 250-563.000.
Yoshida, Yoshinori; Kobayashi, Tutomu; Shinohara, Hironobu; and Hanari, Izumi, to Japan Synthetic Rubber Co., Ltd. Process for preparing unsaturated diesters. 4,131,743, Cl. 560-244.000.
Yoshinaga, Toshimune: *See—*
Nagasaka, Akira; Ashitaka, Hidetomo; Kusuki, Yoshihiro; Oda, Denichi; and Yoshinaga, Toshimune, 4,131,644, Cl. 423-447.500.
Yoshio, Kawasumi: *See—*
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Yoshioka, Hiroshi: *See—*
Hirano, Takayasu; Hisagen, Yoshiaki; Takamizawa, Minoru; and Yoshioka, Hiroshi, 4,131,717, Cl. 428-447.000.
Yuda, Takuo: *See—*
Okuda, Seiji; and Yuda, Takuo, 4,131,258, Cl. 248-73.000.
Zabik, Andrew L.: *See—*
Easton, Ray D.; Jakobi, Phil F.; and Zabik, Andrew L., 4,130,967, Cl. 51-5.00D.
Zahir, Abdul-Cader; and Wyler, Sigfried, to Ciba-Geigy Corporation. Stable resin solutions containing compounds having at least one furyl radical. 4,131,707, Cl. 428-251.000.
Zahler, Wolf-Dietrich: *See—*
Schmitt, Werner; Purrmann, Robert; Jochum, Peter; and Zahler, Wolf-Dietrich, 4,131,729, Cl. 526-282.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See—*
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Zaleckas, Vincent J.: *See—*
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Zalewski, Henry M. Measurement of interpupillary distance. 4,131,338, Cl. 351-5.000.
Zamkov, Vadim N.: *See—*
Gurevich, Samuil M.; Zamkov, Vadim N.; and Prilutsky, Valery P., 4,131,493, Cl. 148-23.000.
Zanelli, Eugene A.: *See—*
Perrone, George L.; Boorman, Robert W.; Holbrook, Michael R.; and Zanelli, Eugene A., 4,131,389, Cl. 415-211.000.
Zapel, Edwin J., to Boeing Company, The. Variable camber trailing edge for airfoil. 4,131,253, Cl. 244-219.000.
Zhomov, Alexandr K.: *See—*
Minachev, Khabib M.; Mortikov, Evgeny S.; Leontiev, Alexandr S.; Smirnov, Anatoly G.; Kononov, Nikolai F.; Masloboev-Shvedov, Alexei A.; Zhomov, Alexandr K.; and Kholdyakov, Nikolai I., 4,131,750, Cl. 568-901.000.
Zierden Company: *See—*
Zierden, Frank P., 4,131,132, Cl. 137-615.000.
Zierden, Frank P., to Zierden Company. Mounting bracket assembly. 4,131,132, Cl. 137-615.000.
Zimmer, Paul B.: *See—*
Mar, Henry Y. B.; and Zimmer, Paul B., 4,131,593, Cl. 260-37.0SB.
Zirngibl, Ludwig; Fischer, Johanna; and Thiele, Kurt, to Siegfried Aktiengesellschaft. Thioethers. 4,131,608, Cl. 260-307.00D.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF DECEMBER, 1978

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Boulogne, Jean: *See—*
Papantoniou, Christos; and Boulogne, Jean, Re. 29,871, Cl. 424-64.000.

Ledford, James B.: *See—*
Niederer, Edward, Jr.; and Ledford, James B., Re. 29,869, Cl. 72-450.000.

L'Oreal: *See—*
Papantoniou, Christos; and Boulogne, Jean, Re. 29,871, Cl. 424-64.000.

McGowen, Harold E., Jr., deceased: *See—*
Moore, Howard H., Jr.; McGowen, Harold E., Jr., deceased; and McGowen, Wanda E. L., executrix, Re. 29,870, Cl. 166-117.500.

McGowen, Wanda E. L., executrix: *See—*
Moore, Howard H., Jr.; McGowen, Harold E., Jr., deceased; and McGowen, Wanda E. L., executrix, Re. 29,870, Cl. 166-117.500.

Moore, Howard H., Jr.; McGowen, Harold E., Jr., deceased; and by McGowen, Wanda E. L., executrix, to Sid W. Richardson Foundation; and Perry R. Bass, Inc. Apparatus for installing and removing flow valves. Re. 29,870, Cl. 166-117.500.

Niederer, Edward, Jr.; and Ledford, James B. Pincer mechanism for pipelines. Re. 29,869, Cl. 72-450.000.

Papantoniou, Christos; and Boulogne, Jean, to L'Oreal. Fatty compositions for use in cosmetic makeup compositions and said cosmetic makeup compositions. Re. 29,871, Cl. 424-64.000.

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Janick, Jules: *See—*
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Weeks, O. L. Rose plant. 4,357, 12-26-78, Cl. 18.000.

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Albert, Gladys, to Albert, Gladys. Combined display and storage unit. 250,624, 12-26-78, Cl. D6-129.000.

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94 4,131,041
100 4,131,042
167 4,131,043
205 4,131,044
403 4,131,045
471.2 4,131,046
698 4,131,047
745 4,131,048

CLASS 84
1.01 4,131,049

CLASS 85
62 4,131,050

CLASS 86
1 R 4,131,051

CLASS 89
11 4,131,052
36 A 4,131,053

CLASS 90
11 D 4,131,054

CLASS 91
378 4,131,055
492 4,131,056

CLASS 93
49 R 4,131,058
81 R 4,131,057

CLASS 96
1 E 4,131,463
1.5 R 4,131,462
22 4,131,464
35 4,131,465
38.3 4,131,472
49 4,131,466
66.3 4,131,467
75 4,131,468
77 4,131,469
107 4,131,470
114 4,131,471

CLASS 98
36 4,131,059
116 4,131,060

CLASS 99
521 4,131,061
638 4,131,062

CLASS 100
162 R 4,131,063

CLASS 102
1 R 4,131,064
49.4 4,131,065

CLASS 104
17 R 4,131,066
4,131,067
172 S 4,131,068

CLASS 105
168 4,131,069
273 4,131,070

CLASS 106
1.12 4,131,473
38.3 4,131,475
38.35 4,131,474
4,131,476
4,131,477
39.5 4,131,479
53 4,131,478
93 4,131,480

CLASS 108
53.1 4,131,071

CLASS 110
106 4,131,072
4,131,073

CLASS 112
121.14 4,131,074
158 E 4,131,075
210 4,131,076
265 4,131,077

CLASS 116
4 4,131,078
22 A 4,131,079

CLASS 118
13 4,131,080
646 4,131,081

CLASS 119
51.5 4,131,082
4,131,083

CLASS 122
33 4,131,084
382 4,131,085

CLASS 123
3 4,131,086
32 EA 4,131,087
32 EE 4,131,089
32 EH 4,131,091
32 EJ 4,131,088
32 SP 4,131,090
32 ST 4,131,092
41.85 4,131,093
48 B 4,131,094
59 EC 4,131,095
90.15 4,131,096
117 R 4,131,097
4,131,098
119 F 4,131,099
148 E 4,131,100
195 C 4,131,101

CLASS 124
5 4,131,102

CLASS 125
13 R 4,131,103

CLASS 126
60 4,131,104
121 4,131,105
4,131,106
270 4,131,109
271 4,131,110
4,131,111
271.2 R 4,131,107
298 4,131,108

CLASS 127
19 4,131,482

CLASS 128
2 B 4,131,112
2 T 4,131,113
90 4,131,114
249 4,131,115
305 4,131,116

CLASS 131
140 C 4,131,117
4,131,118
187 4,131,119
235 R 4,131,120

CLASS 132
7 4,131,121

CLASS 134
1 4,131,483
4,131,484

CLASS 135
76 4,131,122

CLASS 136
89 P 4,131,123
4,131,755
89 PC 4,131,485
89 SJ 4,131,486
230 4,131,756

CLASS 137
45 4,131,124
118 4,131,125
270 4,131,126
384.6 4,131,127
556 4,131,128
559 4,131,131
596.12 4,131,129
596.17 4,131,130
615 4,131,132
624.11 4,131,133
808 4,131,134
856 4,131,135

CLASS 138
110 4,131,136
118.1 4,131,137

CLASS 139
29 4,131,138

CLASS 141
1 4,131,426
4 4,131,139
206 4,131,140
285 4,131,141
302 4,131,142

CLASS 144
30 4,131,143
34 E 4,131,144
4,131,145
221 4,131,146

CLASS 148
1.5 4,131,487
4,131,488
6.16 4,131,489
9.5 4,131,490
12 B 4,131,491
16.6 4,131,492
23 4,131,493
31.57 4,131,494
4,131,495
175 4,131,496
187 4,131,497

CLASS 149
2 4,131,498
19.3 4,131,499

CLASS 150
52 J 4,131,147

CLASS 152
209 B 4,131,148
357 A 4,131,149

CLASS 156
131 4,131,500
157 4,131,501
179 4,131,502
250 4,131,503
384 4,131,504
580.1 4,131,505
643 4,131,506

CLASS 159
23 4,131,507

CLASS 160
368 R 4,131,150

CLASS 162
30 K 4,131,508

CLASS 164
89 4,131,151
359 4,131,152
442 4,131,153
448 4,131,154

CLASS 165
1 4,131,155
51 4,131,156
86 4,131,157
104 S 4,131,158
166 4,131,159

CLASS 166
117.5 Re.29,870
120 4,131,160
265 4,131,161

CLASS 172
138 4,131,162
145 4,131,163

CLASS 173
1 4,131,164
43 4,131,166
48 4,131,165

CLASS 174
107 4,131,757
4,131,758
4,131,759

CLASS 175
323 4,131,167

CLASS 176
38 4,131,509
50 4,131,510
68 4,131,511

CLASS 177
128 4,131,168

CLASS 179

1 P 4,131,760
15 AQ 4,131,762
15 BS 4,131,763
15 BY 4,131,761
15 FD 4,131,766
15 FS 4,131,764
15.55 R 4,131,765
84 L 4,131,770
170.2 4,131,767
178 4,131,768
189 D 4,131,769

CLASS 180

9.62 4,131,169
53 FE 4,131,170
54 R 4,131,171
69 R 4,131,172
90 4,131,173
118 4,131,174
127 4,131,175
131 4,131,176
133 4,131,177

CLASS 181

120 4,131,178
156 4,131,179
163 4,131,180

CLASS 187

11 4,131,181
29 G 4,131,182
29 R 4,131,183

CLASS 192

3.26 4,131,184
53 B 4,131,185
67 R 4,131,186
99 A 4,131,187
113 B 4,131,188
129 B 4,131,189

CLASS 194

1 B 4,131,190
92 4,131,191

CLASS 195

103.5 M 4,131,512

CLASS 198

469 4,131,192
497 4,131,194
533 4,131,193

CLASS 200

11 DA 4,131,771
61.05 4,131,773
61.54 4,131,772
82 B 4,131,774
148 R 4,131,775
158 4,131,776
311 4,131,777

CLASS 202

185 B 4,131,513

CLASS 204

2.1 4,131,515
15 4,131,516
27 4,131,517
38 A 4,131,518
38 B 4,131,519
42 4,131,520
59 R 4,131,521
60 4,131,522
129 4,131,514
129.1 4,131,523
129.3 4,131,524
129.65 4,131,525
149 4,131,526
157.1 R 4,131,527
4,131,528
159.14 4,131,529
192 C 4,131,530
208 4,131,531
256 4,131,532
298 4,131,533
299 R 4,131,534

CLASS 206

205 4,131,195
278 4,131,196
387 4,131,197
419 4,131,198
444 4,131,199
484 4,131,200

CLASS 208

11 LE 4,131,535
139 4,131,536
216 4,131,537
352 4,131,538

CLASS 209

127 A 4,131,539
582 4,131,540
661 4,131,201

CLASS 210

23 F 4,131,541
31 C 4,131,542
36 4,131,543
40 4,131,544
47 4,131,545
77 4,131,546
198 C 4,131,547
331 4,131,548
359 4,131,549

CLASS 211

2 4,131,202
88 4,131,203
192 4,131,204
200 4,131,205

CLASS 214

1 BB 4,131,206
6 DK 4,131,207
8.5 F 4,131,208
85 4,131,209
147 G 4,131,210

CLASS 215

2 4,131,211
252 4,131,212

CLASS 219

10.55 F 4,131,778
10.55 R 4,131,779
70 4,131,780
73 4,131,781
121 LM 4,131,782
124.31 4,131,783
137 WM 4,131,784
326 4,131,785
487 4,131,786
532 4,131,787
535 4,131,788
541 4,131,789

CLASS 221

14 4,131,213

CLASS 222

1 4,131,214
26 4,131,215
52 4,131,216
82 4,131,217
527 4,131,218
603 4,131,219
607 4,131,220
624 4,131,221

CLASS 225

3 4,131,222
94 4,131,223

CLASS 226

8 4,131,224

CLASS 228

161 4,131,225
198 4,131,226

CLASS 229

8 4,131,227
23 R 4,131,228
39 R 4,131,229
40 4,131,230

CLASS 235

89 R 4,131,790

CLASS 237

8 R 4,131,231

CLASS 239

314 4,131,232
381 4,131,233
457 4,131,234
533.15 4,131,235
589 4,131,236
664 4,131,237

CLASS 241

30 4,131,238
39 4,131,239
49 4,131,247

CLASS 242

1 4,131,242
72.1 4,131,240
74 4,131,305
107.2 4,131,244
156.2 4,131,241
199 4,131,243
217 4,131,245

CLASS 244

3.16 4,131,248
4,131,254
3.22 4,131,246
53 A 4,131,249
134 R 4,131,250
137 R 4,131,251
212 4,131,252
219 4,131,253

CLASS 246

430 4,131,255

CLASS 248

3 4,131,256
67.5 4,131,257
73 4,131,258
311.1 R 4,131,259
384 4,131,260
439 4,131,261

CLASS 249

202 4,131,262

CLASS 250

199 4,131,791
4,131,792
211 J 4,131,793
272 4,131,794
315 A 4,131,795
319 4,131,796
322 4,131,797
328 4,131,798
385 4,131,799
439 R 4,131,801
445 T 4,131,802
461 B 4,131,800
563 4,131,803
566 4,131,804

CLASS 252

8.6 4,131,550
29 4,131,552
33 4,131,551
4,131,553
33.6 4,131,554
89 R 4,131,555
106 4,131,556
132 4,131,557
135 4,131,558
171 4,131,559
4,131,560
4,131,561
186 4,131,562
301.1 W 4,131,563
353 4,131,564
417 4,131,565
423 4,131,566
435 4,131,567
455 Z 4,131,568
462 4,131,569
473 4,131,570

CLASS 254

8 B 4,131,263
67 4,131,264

CLASS 260

17 R 4,131,571
4,131,572
17.3 4,131,574
17.4 CL 4,131,577
17.4 GC 4,131,576
17.4 R 4,131,575
17.5 4,131,573
4,131,578
22 EP 4,131,579
23.7 R 4,131,592
29.1 R 4,131,581
29.3 4,131,582
29.6 HN 4,131,583
29.6 MQ 4,131,585
29.6 N 4,131,584
29.6 RW 4,131,580
31.2 R 4,131,586
32.6 A 4,131,587
37 EP 4,131,590
37 N 4,131,591
37 SB 4,131,588
4,131,589
4,131,593
40 R 4,131,594
4,131,595
42.18 4,131,597
4,131,598
45.8 N 4,131,599
123.5 4,131,607
307 D 4,131,608
314.5 4,131,609
326 N 4,131,610
326.8 4,131,611
340.7 4,131,612
343.3 R 4,131,613
345.3 4,131,614
347.3 4,131,615
449.6 M 4,131,616
465 D 4,131,617
543 R 4,131,619
4,131,620
551 C 4,131,621
576 4,131,622
601 R 4,131,623
606.5 P 4,131,624
607 AR 4,131,625
658 R 4,131,626
666 A 4,131,627
4,131,628
4,131,629
666 PY 4,131,630
683.3 4,131,631
834 4,131,632
837 R 4,131,633
845 4,131,634
862 4,131,635
875 4,131,636
877 4,131,637
880 B 4,131,653
897 B 4,131,654
946 4,131,655
951 4,131,656

CLASS 261

39 E 4,131,657
142 4,131,658

CLASS 264

25 4,131,659
26 4,131,660
38 4,131,661
40.2 4,131,663
40.4 4,131,668
40.5 4,131,596
51 4,131,662
138 4,131,415
178 F 4,131,669
256 4,131,670
333 4,131,638
510 4,131,664
521 4,131,666
571 4,131,667
572 4,131,665

CLASS 266

275 4,131,265

CLASS 267

34 4,131,266

CLASS 269

21 4,131,267
47 4,131,268
321 W 4,131,270

CLASS 270

40 4,131,271
73 4,131,272

CLASS 271

4 4,131,273
9 4,131,274

CLASS 273

1 R 4,131,275
58 C 4,131,276
63 D 4,131,277
67 R 4,131,278
73 D 4,131,279
184 R 4,131,280
248 4,131,281
271 4,131,282
282 4,131,283

CLASS 274

23 R 4,131,284

CLASS 277

1 4,131,285
152 4,131,286
191 4,131,287

CLASS 280

11.17 4,131,288
11.37 E 4,131,291
11.37 K 4,131,289
11.37 R 4,131,290
14 4,131,292
166 4,131,293
179 R 4,131,294
475 4,131,295
485 4,131,296
682 4,131,297
727 4,131,298
736 4,131,299
737 4,131,300
789 4,131,301

CLASS 285

114 4,131,302
302 4,131,303

CLASS 290

38 C 4,131,304

CLASS 292

201 4,131,306
268 4,131,307

CLASS 296

1 S 4,131,308
4,131,309
23 R 4,131,310
95 Q 4,131,269

CLASS 297

159 4,131,311
184 4,131,312
188 4,131,313
248 4,131,314
286 4,131,315
341 4,131,316

CLASS 299

2 4,131,416
31 4,131,317

CLASS 301

6 A 4,131,321
36 R 4,131,323
37 PB 4,131,322

CLASS 302

2 R 4,131,318
4,131,320
58 4,131,319

CLASS 303

7 4,131,324
93 4,131,325
115 4,131,326

CLASS 307

147 4,131,805
215 4,131,806
228 4,131,807
270 4,131,808
303 4,131,809
311 4,131,810

CLASS 310

12 4,131,811
13 4,131,812
4,131,813
172 4,131,814
323 4,131,815
348 4,131,816

CLASS 312

241 4,131,327

CLASS 313

95 4,131,818
124 4,131,817
331 4,131,819
377 4,131,820
398 4,131,821
403 4,131,822
422 4,131,823

CLASS 315

39.51 4,131,824
39.61 4,131,825
234 4,131,826

CLASS 318

46 4,131,827
138 4,131,828
139 4,131,829
266 4,131,830
282 4,131,831
358 4,131,832
440 4,131,833
483 4,131,834
562 4,131,835
565 4,131,836
571 4,131,837
603 4,131,838
675 4,131,839
685 4,131,840

CLASS 320

23 4,131,841
61 4,131,842

CLASS 323

9 4,131,843
45 4,131,844

CLASS 324

58.5 A 4,131,845
132 4,131,846
141 4,131,847
236 4,131,848

CLASS 325

54 4,131,849
137 4,131,850
355 4,131,851
363 4,131,852
464 4,131,853

CLASS 328

63 4,131,854
129 4,131,855
155 4,131,856
163 4,131,857

CLASS 330

4.9 4,131,858
124 R 4,131,859
279 4,131,860

CLASS 331

2 4,131,861
4 4,131,862
94.5 G 4,131,863
116 R 4,131,864

CLASS 335

257 4,131,865
262 4,131,866

CLASS 336

65 4,131,867

CLASS 337

113 4,131,868
264 4,131,869

CLASS 338

183 4,131,870
220 4,131,871

CLASS 339

14 R 4,131,328
111 4,131,329
125 R 4,131,330
126 RS 4,131,331
177 R 4,131,332

CLASS 340

1 R 4,131,872
6 R 4,131,873
10 4,131,874
15.5 BH 4,131,875
58 4,131,876
4,131,877
4,131,878
146.3 H 4,131,879
146.3 SY 4,131,880
167 R 4,131,881
310 A 4,131,882
324 AD 4,131,883
347 AD 4,131,885
347 CC 4,131,884
378 R 4,131,886
566 4,131,887
630 4,131,888

CLASS 343

8 4,131,889
108 M 4,131,890
112 S 4,131,891
700 MS 4,131,892
4,131,893
4,131,894
792 4,131,895
815 4,131,896
908 4,131,897

CLASS 346

75 4,131,898
140 R 4,131,899
162 4,131,900
165 4,131,901

CLASS 350

3.86 4,131,337
16 4,131,333
147 4,131,334
218 4,131,335
292 4,131,336

CLASS 351

5 4,131,338
118 4,131,340
132 4,131,341

CLASS 352

43 4,131,342
84 4,131,343
130 4,131,344
132 4,131,345

CLASS 353

15 4,131,346
28 4,131,347
72 4,131,348

CLASS 354

20 4,131,349
31 4,131,350
60 F 4,131,351
86 4,131,352
197 4,131,353
224 4,131,354
225 4,131,355
322 4,131,356

CLASS 355

3 DD 4,131,357
3 TR 4,131,358
15 4,131,359
4,131,360
70 4,131,361
71 4,131,362
75 4,131,363
106 4,131,364

CLASS 356

140 4,131,366
356 4,131,365

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405 4,131,367

CLASS 357

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10 4,131,903
13 4,131,339
17 4,131,904
30 4,131,905
41 4,131,906
42 4,131,907
4,131,908
49 4,131,909
4,131,910
74 4,131,911

CLASS 358

4 4,131,912
44 4,131,913
100 4,131,914
260 4,131,915
281 4,131,917
285 4,131,916

CLASS 360

1 4,131,918
9 4,131,919
51 4,131,920
86 4,131,921
90 4,131,922
106 4,131,923
4,131,924
130 4,131,925
134 4,131,926

CLASS 361

6 4,131,927
56 4,131,928
93 4,131,929
4,131,930
315 4,131,931
356 4,131,932
415 4,131,933
428 4,131,934
433 4,131,935

CLASS 363

43 4,131,936
96 4,131,937
101 4,131,938
126 4,131,939

CLASS 364

200 4,131,940
4,131,941
4,131,942
4,131,943
4,131,944
4,131,945
466 4,131,946
900 4,131,947
4,131,948
4,131,949

CLASS 365

183 4,131,950
203 4,131,951

CLASS 366

81 4,131,368
146 4,131,369
273 4,131,370
301 4,131,371

CLASS 400

196.1 4,131,372
208 4,131,373
232 4,131,374

CLASS 403

12 4,131,376
13 4,131,375
14 4,131,377
93 4,131,378
197 4,131,379
217 4,131,380
353 4,131,381

CLASS 404

69 4,131,382

CLASS 405

24 4,130,994
224 4,130,995

CLASS 407

114 4,131,383

CLASS 408

68 4,131,384
241 B 4,131,385

CLASS 415

98 4,131,386
119 4,131,387
138 4,131,388
211 4,131,389

CLASS 416

20 R 4,131,390
140 4,131,391
142 4,131,392

CLASS 417

22 4,131,393
271 4,131,395
372 4,131,396
404 4,131,397
418 4,131,398
477 4,131,399
481 4,131,394

CLASS 418

203 4,131,400

CLASS 422

45 4,131,431
177 4,131,432

CLASS 423

20 4,131,639
22 4,131,640
34 4,131,641
193 4,131,642
239 4,131,643
447.5 4,131,644
501 4,131,645
591 4,131,646

CLASS 424

10 4,131,647
22 4,131,648
28 4,131,650
64 Re.29,871
78 4,131,651
180 4,131,649
241 4,131,652
244 4,131,671
246 4,131,672
247 4,131,673
248.54 4,131,674
248.56 4,131,676
250 4,131,675
251 4,131,678
256 4,131,677
263 4,131,679
267 4,131,680
4,131,681
275 4,131,682
277 4,131,683
315 4,131,684
322 4,131,685
330 4,131,686

CLASS 425

2 4,131,401
38 4,131,402
127 4,131,403
129 R 4,131,404
143 4,131,405
385 4,131,406
393 4,131,407
410 4,131,408
455 4,131,409
533 4,131,410
559 4,131,411

CLASS 426

3 4,131,687
40 4,131,688
242 4,131,689

CLASS 427

32 4,131,690
41 4,131,691
101 4,131,692
117 4,131,693
126 4,131,694
148 4,131,695
164 4,131,696
249 4,131,697
304 4,131,698
306 4,131,699
322 4,131,700

CLASS 428

36 4,131,701
76 4,131,702
95 4,131,703
4,131,704
106 4,131,705
116 4,131,706
251 4,131,707
257 4,131,708
261 4,131,709
328 4,131,710
332 4,131,711
364 4,131,713
379 4,131,714
413 4,131,715
425 4,131,716
447 4,131,717
548 4,131,718
598 4,131,719
619 4,131,720

CLASS 429

13 4,131,721
55 4,131,722
81 4,131,723

CLASS 431

16 4,131,412
44 4,131,413
104 4,131,414

CLASS 432

6 4,131,417
80 4,131,418
205 4,131,419
246 4,131,420
247 4,131,421

CLASS 521

91 4,131,481

CLASS 526

16 4,131,724
18 4,131,726
23 4,131,727
56 4,131,725
204 4,131,728
282 4,131,729

CLASS 528

45 4,131,603
49 4,131,602
53 4,131,600
58 4,131,606
77 4,131,605
79 4,131,604
279 4,131,601
327 4,131,730
335 4,131,712
370 4,131,731

CLASS 536

121 4,131,732

CLASS 542

406 4,131,733

CLASS 544

26 4,131,734
267 4,131,735

CLASS 560

14 4,131,736
29 4,131,751
121 4,131,737
4,131,738
179 4,131,739
180 4,131,740
241 4,131,741
4,131,742
244 4,131,743
252 4,131,744
4,131,745
255 4,131,746

CLASS 562

469 4,131,618
4,131,747
488 4,131,748

CLASS 568

781 4,131,749
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